Manitoba
Mineral Resources

Ressources minières
Manitoba

Annual Report
2013 - 2014

Rapport annuel
2013 - 2014

Manitoba

His Honour, The Honourable Philip S. Lee, C.M., O.M.
Lieutenant Governor of Manitoba
Room 235, Legislative Building
Winnipeg, Manitoba R3C 0V8

Your Honour:

I am pleased to present the Annual Report for the Department of Mineral Resources for the fiscal year ending March 31, 2014.

Yours sincerely,

Dave Chomiak
Minister

Son Honneur l'honorable Philip S. Lee, C.M., O.M.
Lieutenant-Gouverneur du Manitoba
Palais législatif, bureau 235
Winnipeg (Manitoba) R3C 0V8

Votre Honneur,

J'ai le plaisir de présenter à Votre Honneur le rapport annuel du ministère des Ressources minières pour l'exercice se terminant le 31 mars 2014.

Je vous prie d'accepter, Votre Honneur, l'expression de mes sentiments les plus respectueux.

Le ministre,

Document original signé par :

Dave Chomiak

Manitoba

Mineral Resources
Deputy Minister
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Honourable Dave Chomiak
Minister of Mineral Resources
Room 317, Legislative Building
Winnipeg MB R3C 0V8

Dear Minister Chomiak:

I have the honour of presenting the Annual Report for the Department of Mineral Resources for the period April 1, 2013 to March 31, 2014.

Manitoba's mining and petroleum industries are experiencing continued growth and remain two of the province's key economic drivers. The mission of the department is to facilitate the sustainable development of the province's mineral and petroleum resources.

The department has undertaken many activities in collaboration with our partners and stakeholders. I have profiled below a few accomplishments that are a result of the activities:

- The mining and petroleum industries make up the second-largest primary resource industry of Manitoba's economy. The 2013 value of mining and petroleum production totalled $3 billion.

- In 2013, capital expenditures on mining and petroleum development totalled an estimated $1.4 billion, and the industries accounted for approximately 7% of provincial GDP and about 8.7% of total exports. Manitoba's mining and petroleum industries directly employed an average of 6,300 people.

- Two new mines near Snow Lake began production in 2013. Hudbay's Reed and Lalor mines will produce copper, zinc and gold.

- The department doubled funding for the Mineral Exploration Assistance Program (MEAP), with $3 million available in assistance this year to companies with Manitoba-based exploration projects. Companies can receive up to a 50 per cent rebate in exploration expenses. Funding for the Manitoba Prospectors Assistance Program (MPAP) was increased to $125,000. This program provides grants to prospectors exploring on either their own properties or open Crown mineral land.

- The department introduced double work assessment credits for all eligible exploration expenses incurred in calendars years 2014 and 2015 to help companies retain their mineral dispositions during these challenging economic times.

- The inaugural meeting of the Minister's Mining Advisory Council was held on October 17, 2013. The Council brings leadership from Manitoba, First Nations and the minerals industry together with the objective of increasing First Nation participation in Manitoba's mineral resources sector.

- In 2013, Manitoba acquired BHP Billiton's 51% interest in the Manitoba Potash Corporation (MPC). Manitoba now owns 100% of MPC and is interested in selling the company or all of its potash interests in the Russell – McAuley potash deposit to a purchaser who will develop a potash mine in Manitoba.

- In 2013, oil and gas industry activity continued at near record levels with the drilling of 537 wells. Oil production totalled 19.2 million barrels and industry expenditures topped $1.3 billion

- The Manitoba Drilling Incentive Program was enhanced and extended four years to December 31, 2018. Incentives were introduced to encourage the implementation of gas conservation projects that reduce flaring and venting of solution gas.

- In 2013, the Manitoba Geological Survey completed new bedrock mapping at Oxford Lake as part of an ongoing effort to remap select greenstone belts in the northwestern Superior province. In the Pikwitonei domain, new bedrock mapping at Cauchon and Partridge Crop lakes focused on comparing the granulite-grade gneissic rocks with similar and potentially equivalent sequences in the adjacent Thompson Nickel belt. Bedrock mapping in the Trans-Hudson orogen continued in the Snow Lake area alongside collaborative programs by the Geological Survey of Canada (GSC) and university partners. The Manitoba Geological Survey also undertook new work to better define the settings of various mineral commodities across the province: gold in the Rice Lake belt, rare metals in the northern Trans-Hudson orogen, and magmatic base metals and platinum-group elements in the Bird River belt.

- The Manitoba Geological Survey also partnered with the federal government, universities and the mining industry to provide new information about the Lalor volcanogenic massive-sulphide deposit near Snow Lake and the mafic–ultramafic intrusions and nickel-copper-chrome-platinum-palladium mineralization in the Bird River belt. These advances help established mining communities by identifying new targets for private industry exploration, potentially leading to new discoveries.

- Phanerozoic investigations in southwestern Manitoba focused on the upper Cretaceous sedimentary section. In the Hudson Bay Lowland, lithofacies of a Silurian formation with petroleum reservoir potential were analyzed in detail with Federal and university partners.

- As part of an ongoing effort to support mineral exploration in heavily drift covered areas, Quaternary sediments within a large tract of land east and northeast of Southern Indian Lake were mapped and sampled in 2013. In addition, Quaternary mapping was started in the Gillam area in preparation for a larger program planned for next year in collaboration with Manitoba Hydro and university partners.

- The Orphan and Abandoned Mine Site Rehabilitation Program was introduced in 2009 with a dedicated budget to address the rehabilitation of orphan and abandoned mine sites. To date, $185 million has been spent, and 28 high hazard sites have been rehabilitated. Rehabilitation work at the Farley Mine site in Lynn Lake and at Elk Island Mine site at God's Lake has been substantially completed. Rehabilitation work continues at Ruttan and Sherridon as well as three remaining High Hazard sites.

- The 2013 Manitoba Mining and Minerals Convention had a record 96 trade show booths and over 1000 delegates attended the Convention.

The department will continue with implementing innovative initiatives and strategic planning that will contribute to Manitoba's economic growth.

Respectfully submitted,

Hugh Eliasson
Deputy Minister of
Mineral Resources

Manitoba

Ressources minières

Sous-ministre
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Monsieur Dave Chomiak
Ministre des Ressources minières
Palais législatif, bureau 317
Winnipeg (Manitoba) R3C 0V8

Monsieur le Ministre,

J'ai l'honneur de vous présenter le rapport annuel du ministère des Ressources minières pour la période du 1er avril 2013 au 31 mars 2014.

Les industries minière et pétrolière du Manitoba continuent de croître et demeurent deux des moteurs économiques clés de la province. Le ministère a pour mission de faciliter le développement durable des ressources minières et pétrolières du Manitoba.

Le ministère a mené de nombreuses activités en collaboration avec ses partenaires et les groupes intéressés. J'ai décrit ci-dessous quelques réalisations qui résultent de ces activités.

- Les industries minière et pétrolière représentent conjointement le deuxième secteur des ressources primaires, en importance, de l'économie du Manitoba. La valeur de la production minière et pétrolière a atteint trois milliards de dollars en 2013.

- En 2013, les dépenses en capital consacrées au développement minier et pétrolier ont atteint un total estimé à 1,4 milliard de dollars, et les produits de ces industries représentaient environ 7 % du PIB provincial et près de 8,7 % de l'ensemble des exportations.

- Les industries minière et pétrolière du Manitoba ont employé directement 6 300 personnes en moyenne.

- Deux nouvelles mines près de Snow Lake sont devenues opérationnelles en 2013. Les mines Hudbay's Reed et Lalor produiront du cuivre, du zinc et de l'or.

- Le ministère a doublé les fonds alloués au Programme d'aide à l'exploration minière, et a mis cette année trois millions de dollars d'aide financière à la disposition des sociétés qui réalisent des projets d'exploration au Manitoba. Les sociétés peuvent bénéficier d'un remboursement de jusqu'à 50 % de leurs dépenses d'exploration. Le financement affecté au Programme d'aide à la prospection du Manitoba a été augmenté à 125 000 $. Ce programme offre des subventions aux prospecteurs qui se livrent à des activités d'exploration sur leurs propres terres ou sur un bien-fonds de minéraux domaniaux.

- Le ministère a introduit des crédits d'évaluation des travaux d'exploration doublés pour toutes les dépenses d'exploration admissibles engagées au cours des années civiles 2014 et 2015 afin d'aider les sociétés d'exploration à conserver leurs aliénations minières dans le présent contexte économique difficile.

- La séance inaugurale du conseil consultatif pour le secteur minier du ministre a eu lieu le 17 octobre 2013. Le conseil réunit des leaders du Manitoba, des Premières Nations et de l'industrie

minière avec l'objectif d'augmenter la participation des Premières Nations au secteur des ressources minières de la province.

- En 2013, la Province a acquis les intérêts de BHP Billiton (51 %) dans la Manitoba Potash Corporation (MPC). Le Manitoba possède maintenant 100 % de la MPC et souhaiterait vendre la corporation ou tous ses intérêts dans le gisement de potasse de la région de Russel-McAuley à un acheteur prêt à développer une mine de potasse au Manitoba.

- En 2013, les activités de l'industrie pétrolière et gazière se sont poursuivies à des niveaux presque record avec le forage de 537 puits. La production pétrolière a totalisé 19,2 millions de barils et les dépenses de l'industrie ont atteint 1,3 milliard de dollars.

- Le Programme d'encouragement au forage du Manitoba a été amélioré et prolongé pendant quatre ans jusqu'au 31 décembre 2018. Des mesures incitatives ont été prises dans le but d'encourager la mise en œuvre de projets de conservation de gaz qui réduisent le gaz naturel dissous brûlé et ventilé.

- En 2013, la Direction des services géologiques du Manitoba a terminé un nouveau projet de cartographie du substrat rocheux au lac Oxford dans le cadre des efforts continus visant à redéfinir certaines ceintures de roches vertes dans le nord-ouest de la province du lac Supérieur. Dans le domaine de Pikwitonei, un nouveau projet de cartographie du substrat roche entrepris aux lacs Cauchon et Partridge Crop s'est focalisé sur la comparaison des roches gneissiques composées de granulites avec des séquences similaires et potentiellement équivalentes dans la ceinture nickélifère de Thompson adjacente. La cartographie du substrat rocheux dans l'orogène trans-hudsonien s'est poursuivie dans la région de Snow Lake conjointement avec des programmes collaboratifs de la Commission géologique du Canada (CGC) et des partenaires universitaires. La Direction des services géologiques du Manitoba a également mis en œuvre un nouveau projet pour mieux définir les cadres géologiques de divers minéraux métallifères dans l'ensemble de la province : l'or dans la ceinture aurifère du lac Rice, des métaux rares dans l'orogène trans-hudsonien du nord, et des métaux communs magmatiques et des éléments du groupe des platineux dans la ceinture de la rivière Bird.

- La Direction des services géologiques du Manitoba a également formé un partenariat avec le gouvernement fédéral, des universités et l'industrie minière pour fournir de nouveaux renseignements au sujet du gisement de sulfures massifs volcanogènes de Lalor près de Snow Lake ainsi que des intrusions mafiques-ultramafiques et de la minéralisation de nickel-cuivre-chrome-platine-palladium dans la ceinture de la rivière Bird. Ces données aident les collectivités minières établies en répertoriant de nouvelles cibles d'exploration pour l'industrie privée et, par conséquent, en offrant la possibilité de nouvelles découvertes.

- Des études géologiques du Phanérozoïque dans le sud-ouest du Manitoba ont porté sur la coupe sédimentaire du Crétacé supérieur. Dans les basses-terres de la baie d'Hudson, des lithofaciès d'une formation silurienne avec un potentiel de réservoir de pétrole ont été analysés en détail de concert avec des partenaires fédéraux et universitaires.

- Dans le cadre des efforts continuels visant à appuyer l'exploration minière dans les régions recouvertes d'une épaisse couche de dépôts glaciaires, les sédiments Quaternary dans les limites d'une grande bande de terre à l'est et au nord-est du lac Southern Indian ont été cartographiés et échantillonnés en 2013. Par ailleurs, la cartographie du quaternaire a été mise en route dans la région de Gillam en prévision d'un programme plus important prévu l'année prochaine en collaboration avec Hydro-Manitoba et des partenaires universitaires.

- Le Programme de restauration des sites miniers abandonnés et orphelins du Manitoba a été mis sur pied en 2009 avec un budget consacré à la restauration de ce genre de sites. Jusqu'à présent, 185 millions de dollars ont été dépensés et on a procédé à la restauration de 28 sites à risques

élevés. Les travaux de restauration du site minier Farley à Lynn Lake et du site de l'île Elk à God's Lake sont en grande partie terminés. Des travaux de restauration se poursuivent à Ruttan et à Sherridon ainsi qu'aux trois sites à risques élevés restants.

- Le Congrès annuel manitobain sur les mines et les minéraux de 2013 a accueilli 96 stands d'exposition et plus de 1 000 délégués.

Le ministère continuera de promouvoir la planification stratégique et les initiatives innovatrices qui contribueront à la croissance économique du Manitoba.

Le tout respectueusement soumis.

Le sous-ministre des Ressources minières,

Hugh Eliasson

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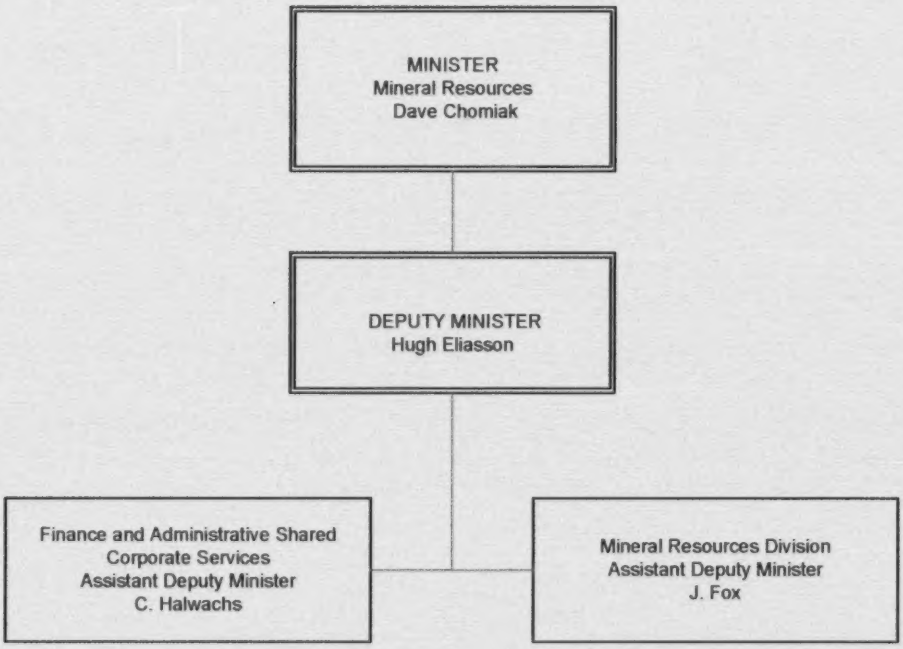
Schedule 1

MINERAL RESOURCES
ORGANIZATION CHART
As of March 31, 2014



PREFACE

REPORT STRUCTURE

The Annual Report is organized in accordance with the department's appropriation structure and the Main Estimates of Expenditure for the Province. The Report includes financial performance and variance information at the main and sub-appropriation levels and information relating to the department's objectives and results at the sub-appropriation level. The Report also includes information about associated agencies, revenue and expenditures, a five-year comparison of expenditures and a staffing analysis.

STATUTORY RESPONSIBILITIES

The Minister of Mineral Resources is responsible for the following:

The Gaming Control Act	G 5
The Gaming Control Local Option (VLT) Act	G 7
The Mines and Minerals Act	M 162
The Mining and Metallurgy Compensation Act	M 190
The Oil and Gas Act	O 34
The Oil and Gas Production Tax Act	O 37
The Surface Rights Act	S 235
The Thompson Nickel Belt Sustainability Act	T 58

As per Order-In-Council 382/2013

SUSTAINABLE DEVELOPMENT

The department is committed to the Principles and Guidelines set out in The Sustainable Development Act and works to incorporate them in department activities, programs and business practices.

The Principles and Guidelines of Sustainable Development are:

1. Integration of Environmental and Economic Decisions
2. Stewardship
3. Shared Responsibility and Understanding
4. Prevention
5. Conservation and Enhancement
6. Rehabilitation and Reclamation
7. Global Responsibility
8. Efficient uses of Resources
9. Public Participation
10. Access to Information
11. Integrated Decision Making and Planning
12. Waste Minimization and Substitution
13. Research and Innovation.

The Sustainable Development Procurement Goals:

1. Education, Training and Awareness
2. Pollution Prevention and Human Health Protection
3. Reduction of Fossil Fuel Emissions
4. Resource Conservation
5. Community Economic Development

ORGANIZATION

The department's 2013/2014 organization structure is illustrated in the Organization Chart, page i. The roles, responsibilities and staffing are outlined in the following information.

ROLE AND RESPONSIBILITIES

MINISTER

HONOURABLE DAVE CHOMIAK

DEPUTY MINISTER

HUGH ELIASSON

VISION STATEMENT

Realizing Manitoba's mineral and petroleum potential, creating wealth for the benefit of all Manitobans.

ROLE AND MISSION

Facilitating sustainable development of the province's mineral and petroleum resources by:

- encouraging investment;
- enhancing geoscience knowledge;
- promoting wise land-management and access to resources;
- ensuring rehabilitation of lands affected by resource development;
- creating strategic partnerships;
- working with local and Aboriginal communities;
- championing critical policy development; and
- advancing opportunities for Aboriginal involvement in resource development.

FOCUS

The Department will:

- Maintain an effective and efficient fiscal, legislative and regulatory framework for exploration and development of Manitoba's mineral and petroleum resources
- Promote development of Manitoba's mineral and petroleum resources
- Address human resources skills and capacity issues in mineral sector
- Provide timely access to information on Manitoba's mineral and petroleum resources
- Provide geoscience programming to support and advance mineral and petroleum exploration and development in the province
- Partner with internal and external agencies and organizations to leverage geoscience funding
- Work to increase Aboriginal participation in Manitoba's mineral sector
- Promote reconciliation and ongoing relationship building with Aboriginal communities
- Promote access to lands with medium/high mineral and petroleum resource potential
- Ensure mineral and petroleum resource development is carried out in an environmentally responsible manner

To achieve its mission, the department is organized in two divisions:

ADMINISTRATION AND FINANCE DIVISION provides for the executive management, planning and control of departmental policies and programs. Administrative support is provided through the Department of Jobs and the Economy in the areas of finance and administration and management information systems.

THE MINERAL RESOURCES DIVISION promotes wise land management and environmentally sustainable economic development in the province based on Manitoba's mineral and petroleum resources; provides authoritative documentation of the province's mineral and petroleum endowment and development potential; delivers mineral incentive programs; administration of legislation governing the disposition of mineral and petroleum rights, exploration, development and production of Manitoba's mineral and petroleum resources and, the rehabilitation of mines, quarries and abandoned petroleum sites; provides for the resolution of disputes between surface and/or mineral rights holders with respect to accessing minerals including oil and gas.

ADMINISTRATION AND FINANCE

The Administration and Finance Division comprises the Executive Support Offices and the shared Financial and Administrative Services section of Jobs and the Economy.

MINISTER'S SALARY AND EXECUTIVE SUPPORT

Executive Support includes the Offices of the Minister and Deputy Minister. The Minister provides leadership and direction to ensure the goals and objectives of the department are accomplished. The Office of the Deputy Minister provides the Minister with advice and information regarding issues and matters of concern to the department. Executive Support is responsible for providing the department with policy direction and the overall planning and co-ordination of departmental activities.

18-1(a) Minister's Salary

Expenditures by Sub-Appropriation	Actual 2013/14 $(000)	Estimate 2013/14 FTE	Estimate 2013/14 $(000)	Variance Over (Under)	Expl. No.
Minister's Salary	37	1.00	37	-	
Total Sub-Appropriation	**37**	**1.00**	**37**	**-**	

18-1(b) Executive Support

Expenditures by Sub-Appropriation	Actual 2013/14 $(000)	Estimate 2013/14 FTE	Estimate 2013/14 $(000)	Variance Over (Under)	Expl. No.
Total Salaries & Employee Benefits	445	5.00	445	-	
Total Other Expenditures	68		73	(5)	
Total Sub-Appropriation	**513**	**5.00**	**518**	**(5)**	

ADMINISTRATION AND FINANCE

FINANCIAL AND ADMINISTRATIVE SERVICES

Financial and Administrative Services is comprised of two primary components: Finance and Administration and Computer Services. The branch provides shared Financial, Administrative and Computer Services to the departments of Jobs and the Economy, Mineral Resources and Labour and Immigration.

OBJECTIVES

The objectives of Financial and Administrative Services are to: provide leadership, program direction and operational coordination to support department activities; to provide high quality, timely and customer responsive administrative, financial management and information technology, develop and administer appropriate administrative and financial standards, policies and procedures; and to develop and maintain appropriate reporting systems to provide timely and accurate decision-making information to senior management in the departments and in central agencies through a centralized support service.

ACTIVITIES/RESULTS

Finance and Administration supports the mission and goals of the Department by:

- Processing payments and receipts;
- Providing computer business application development and support services;
- Administering and coordinating the Department's parking and pool vehicle programs;
- Providing for physical accommodations;
- Providing advisory and specialized accounting and financial management services to departmental personnel and related entities;
- Coordinating French Language services;
- Coordinating the departmental administration of the *Freedom of Information and Protection of Privacy Act* and *The Public Sector Disclosure (Whistleblower Protection) Act*;
- Managing the department's records management program; and
- Providing timely, accurate and relevant information to departmental and central agency decision-makers including budgetary, cash flow and year end reporting.

18-1(c) Financial and Administrative Services

Expenditures by Sub-Appropriation	Actual 2013/14 $(000)	Estimate 2013/14 FTE	Estimate 2013/14 $(000)	Variance Over (Under)	Expl. No.
Total Other Expenditures	150		150	-	
Total Sub-Appropriation	**150**		**150**	**-**	

MINERAL RESOURCES

MANITOBA GEOLOGICAL SURVEY

OBJECTIVES

The **Manitoba Geological Survey** (MGS) provides authoritative geoscience information to support and facilitate mineral and petroleum exploration in the province, and also conducts a broad range of geoscience activities that address land-use and environmental issues facing Manitobans.

The Manitoba Geological Survey is responsible for monitoring industry and commodity information used in formulating Manitoba's minerals policies, promoting mining and exploration investment opportunities, administration of Manitoba's mineral exploration incentive programs and organizing and staging of the annual Mining and Minerals Convention. The branch also helps facilitate the provision of community adjustment services to communities facing mine closure. To achieve these goals, the MGS works closely with the Mines Branch, as well as all affected government departments.

ACTIVITIES/RESULTS

GEOSCIENCE PROGRAM

In 2013, the Manitoba Geological Survey completed new bedrock mapping at Oxford Lake as part of an ongoing effort to remap select greenstone belts in the northwestern Superior province, in conjunction with thematic studies. In the Pikwitonei domain, new bedrock mapping at Cauchon and Partridge Crop lakes focused on identifying the protoliths of granulite-grade gneissic rocks to facilitate comparisons with lower grade, potentially equivalent rocks in adjacent domains. Bedrock mapping in the Trans-Hudson orogen continued in the Snow Lake area alongside collaborative programs by the Geological Survey of Canada (GSC) and university partners. The Manitoba Geological Survey also undertook new work to better define the settings of various mineral commodities across the province: gold in the Rice Lake belt, rare metals in the northern Trans-Hudson orogen, and magmatic base metals and platinum-group elements in the Bird River belt.

Phanerozoic investigations in southwestern Manitoba focused on the upper Cretaceous sedimentary section and included radiometric dating of bentonite beds, evaluation of rare-earth–element potential and regional stratigraphic correlations. In the Hudson Bay Lowland, lithofacies of a Silurian formation with petroleum reservoir potential were analyzed in detail with Federal and university partners.

As part of an ongoing effort to support mineral exploration in heavily drift covered areas, Quaternary sediments within a large tract of land east and northeast of Southern Indian Lake were mapped and sampled in 2013. In addition, Quaternary mapping was started in the Gillam area in preparation for a larger program planned for next year.

MGS' geoscience program is reviewed annually by the Mineral Exploration Liaison Committee (MELC), composed of members of the Mining Association of Manitoba, the Manitoba Prospectors and Developers Association and the Manitoba-Saskatchewan Prospectors and Developers Association, as well as representatives from the universities of Manitoba and Brandon, and the GSC. Petroleum-related program discussions are ongoing with industry contacts throughout the year, and at annual conferences in Calgary.

Collaborations with industry, Federal, university and other provincial agencies

The MGS is engaged in many partnered initiatives, including contributions from the federal government, the mineral industry, provincial surveys, several Canadian universities, and Manitoba Hydro. These partnerships provide the MGS access to expertise and technologies that enhance our ability to provide a state-of-the-art geoscience database for Manitoba. These programs facilitate the training of future geoscience professionals, which in 2013/14 included four Ph.D. candidates, two M.Sc. students, and two B.Sc. Honours thesis projects.

A number of partnered projects continued in 2013/14. Some, such as a shale gas initiative with Manitoba Hydro and the University of Calgary, branch into new and important fields of research. The shale gas initiative is looking at the geochemistry of the Favel and Carlile formations to understand their gas-bearing and gas-extractive capacity. An ongoing M.Sc. project is looking at the underexplored Devonian Duperow Formation in southwestern Manitoba to characterize its stratigraphy and evaluate its hydrocarbon potential. Collaborative research projects between industry, universities and the MGS, all involving Ph.D. studies, include: Laurentian University with financial support of Alexis Minerals Corporation in the Snow Lake area, University of Ottawa with industry support by Hudson Bay Exploration and Development Company Limited on the Lalor deposit and hostrocks near Snow Lake, and University of Waterloo with support by Bison Gold in the Rice Lake belt.

In August 2013, the Government of Canada announced a seven-year renewal of the Geo-mapping for Energy and Minerals (GEM) program, the first phase of which ended in the spring of 2013. The GEM program is designed to provide geoscience information on Canada's northern regions, to facilitate informed investment decisions and to foster discovery and development of new energy and mineral resources. In Manitoba, the GEM-Minerals program was used to procure a GSC-funded airborne radiometric and magnetic survey in the Seal River region, and as support for surficial mapping and geochronology in conjunction with the Manitoba Geological Survey's 2008–2012 Far North Geomapping Initiative. A second project, focused on the hydrocarbon potential of Phanerozoic strata of the Hudson Bay and Foxe basins, was funded under the GEM-Energy program. This project used a multifaceted approach to understand and characterize the hydrocarbon potential of lower Paleozoic marine strata in the Hudson Bay Lowland of Manitoba. Both the GEM-Minerals and the GEM-Energy projects in Manitoba have been highly successful; new collaborative opportunities in the Manitoba portion of the Hudson-Ungava region of interest under the GEM2 program are being discussed.

The Targeted Geoscience Initiative (TGI) is a federally funded program that is co-planned and jointly delivered with the provinces and territories, which contribute funding for activities within their jurisdictions under the program. The TGI-4, announced in early 2010, is the fourth such initiative since 2000 and focuses on deep exploration and exploration-methods development. Projects being conducted under the TGI-4 are currently in the third year of field study and include alteration and metallogenic studies of the Lalor volcanogenic massive-sulphide (VMS) deposit near Snow Lake; a three-dimensional seismic survey and ambient-noise imaging of the Lalor deposit; and studies of mafic–ultramafic intrusions and Ni-Cu-Cr-Pt-Pd mineralization in the Bird River belt.

Activities and results for 2013/14 are listed below as they pertain to MGS Program Objectives.

1. Increasing Manitoba's minerals geoscience knowledge base

Superior Province

In 2013, the Manitoba Geological Survey completed bedrock mapping of Oxford Lake, which lies at the western end of the largest contiguous greenstone belt in the northwestern Superior province. The Oxford Lake–Knee Lake belt is central to understanding the stratigraphy, tectonic evolution and economic potential of a large and geologically diverse region that includes some of the most prospective yet underexplored greenstone belts in the Superior province. Based on the combined results from the 2012 and 2013 field seasons, the supracrustal succession at Oxford Lake is divided into four tectonostratigraphic assemblages and three major structural panels bounded by ductile shear zones. Results from this program will be used to further constrain the stratigraphic and structural context of known base- and precious-metal occurrences at Oxford Lake.

Bedrock mapping in the Archean Pikwitonei domain, situated at the northwestern margin of the Superior province, continued in 2013 with projects at Cauchon and Partridge Crop lakes. In both areas, variably retrogressed granulite-facies rocks were remapped with emphasis on interpretation of protoliths and further understanding the polyphase tectonothermal evolution. The new mapping at Cauchon Lake reveals the presence of significant volumes of supracrustal rocks, similar to recognizable sequences in adjacent lower grade domains. High-grade metamorphic terranes have traditionally been underexplored, due in part to the challenge of recognizing supracrustal rocks, which tend to hold the greatest economic potential. The fact that some world-class mineral deposits are hosted in granulite-facies rocks, together with evidence that high-grade metamorphism can be responsible for the localized concentration of metals to form economic mineral deposits, warrants a new assessment of the mineral potential of the Pikwitonei

domain. The proximity of the Partridge Crop Lake area to the Thompson nickel belt, moreover, provides opportunity to evaluate effects and extent of the Paleoproterozoic overprint and to compare rocks common to both the Thompson nickel belt and the Pikwitonei domain.

In southeastern Manitoba, the eastern extension of the Rice Lake mine trend in the Rice Lake greenstone belt was mapped in detail in 2013, taking advantage of clean bedrock exposures created by a 2011 forest fire in an area that had not been mapped by MGS in more than 60 years. Many of the exposures are volcanic, volcaniclastic, epiclastic and subvolcanic intrusive rocks corresponding to the Rainy Lake Road unit of the Gem assemblage. The stratigraphy, depositional setting and structural geology of these rocks suggest good potential for orogenic lode-gold and VMS deposits. Equivalent rocks to the west host several significant gold deposits, including the Rice Lake deposit at Bissett.

Geological mapping along the northern arm of the Bird River greenstone belt in southeastern Manitoba progressed into the Cat Lake–Euclid Lake area. This area contains several Archean layered mafic–ultramafic intrusions, some of which are associated with and have been explored for magmatic Ni-Cu-PGE sulphide and chromite deposits, and are similar to the Mayville intrusion to the west-northwest. As part of the TGI-4 program, the geological architecture and apparent stratigraphy of the Euclid Lake intrusion, a historical chrome deposit, is being re-examined with recent drillhole and historical data. In addition to magmatic mineralization associated with mafic–ultramafic intrusions, a suite of tonalite-trondhjemite-granodiorite (TTG) intrusions in the northeastern Bird River greenstone belt show evidence of potential for Cu-(Au) porphyry and skarn mineralization, and rare-metal (Li, Cs, Nb, Ta) mineralization has been documented in a late peraluminous granitoid suite and associated pegmatites. New U-Pb ages and geochemical data for the main tectonic assemblages in the Cat Lake–Euclid Lake area will facilitate exploration for a variety of commodities by providing a new geological framework for the northeastern arm of the Bird River greenstone belt.

Also in 2013, the MGS continued Quaternary analytical and digital mapping studies of the Knee Lake area, located east of Oxford Lake. This project augments an already substantial amount of Quaternary data for this area, collected during the MGS Operation Superior project (1999-2001). This new research focuses on: i) providing a better understanding of the glacial history in the region, ii) continuing till geochemistry and kimberlite indicator mineral sampling surveys, and iii) conducting lithological analyses of clasts within till to assist mineral exploration in this region underlain by prospective bedrock but mantled by deposits of varying thicknesses and different provenances. The resulting data have been compiled to update the surficial geological maps of the area.

Trans-Hudson orogen

New geological mapping of the Reed Lake area in the Flin Flon belt was initiated in 2013 with 1:20 000 scale mapping in the Rail Lake–Sewell Lake area southwest of Snow Lake. Bimodal volcanic rocks in the study area belong to the Fourmile Island assemblage, which hosts five known VMS deposits (Rail, Dickstone, Fourmile Island, Reed Lake, Lon) and one orogenic gold deposit (North Star). The objective of the new geological investigations is a better understanding of the distribution and economic potential of arc-related volcanic rocks by documenting along-strike continuity of prospective stratigraphy and/or alteration assemblages away from the known deposits.

A program of lithostratigraphic and structural mapping was continued within the McLeod Road–Birch Lake thrust panel in the Snow Lake area as part of a Ph.D. study at Laurentian University. The New Britannia mine (now 'Snow Lake mine') is a structurally controlled gold deposit hosted by mafic and felsic volcanic and volcaniclastic rocks in the hangingwall of the McLeod Road thrust. Combined surface mapping and drillcore logging have focused on documenting the volcanic stratigraphy, structural framework and deformation history of the thrust panel, to guide ongoing gold exploration.

Reconnaissance geological investigations of granitic pegmatite at Southern Indian Lake, Partridge Breast Lake and South Bay were conducted to evaluate the potential for rare-metal mineralization in the northern part of the Trans-Hudson orogen. Of particular interest is an unusual style of polymetallic Be-Au-Zn-Bi mineralization hosted by pegmatite at Southern Indian Lake. Pegmatite at Partridge Breast Lake locally shows significant B-Nb-Ta mineralization (tourmaline and columbite), and a pegmatite field at South Bay is enriched in Li-Cs-Ta (beryl and columbite), suggesting exploration potential. In addition to the investigated pegmatites, mineral studies and whole-rock geochemistry on samples collected from the Thorsteinson Lake granite will be used to evaluate its potential for Nb-Y-F mineralization. Results of the

ongoing rare-metal investigations contribute to an updated rare-metal inventory of Manitoba, initiated by MGS in 2011.

Remapping of the southern extension of the Flin Flon Belt lying under Phanerozoic cover was initiated in 2009 by the Manitoba Geological Survey to produce revised geological maps of an area that is the focus of significant new mineral exploration. A key portion of the remapping effort consists of building a comprehensive database of historical data (drillcore logs, geochemistry, etc.) for the sub-Phanerozoic Flin Flon Belt, using a Microsoft® Access® database. The development of a comprehensive database of all existing geoscientific data in the sub-Phanerozoic Flin Flon Belt will be of great assistance in revising the geological maps of the area, as well as in producing three-dimensional (3-D) models of areas of interest. The newly acquired ability to bring such historical data into a Geographic Information Systems (GIS) environment will also help achieve a better understanding of the regional distribution of geological domains and prospective assemblages, providing valuable guidance for current and future mineral exploration programs.

Southwestern Manitoba

The Cretaceous Gammon Ferruginous Member of the Pierre Shale has been intersected in thousands of oil wells in southwestern Manitoba and locally contains elevated concentrations of rare-earth elements (REE), as indicated by outcrop samples collected in 2012. Follow-up investigations in 2013 focused on comparisons of the Gammon Ferruginous Member to other Cretaceous shale horizons. Preliminary geochemical results from new shale samples yielded significant total REE contents (>3000 ppm), of which about 30% is represented by the more economically attractive heavy REE. These values are higher than those reported for some active REE exploration projects. Ongoing investigations, including electron-microprobe analysis of apatite and zircon, which are presumably the major REE phases in the shale, will document the REE distribution and mineralogy of the Gammon Ferruginous Member, and assess the potential for a new type of REE deposit in Manitoba.

Radiometric dating of bentonite beds in southwestern Manitoba is being conducted to provide absolute time markers for Upper Cretaceous stratigraphy. New U-Pb zircon ages of 81.5 ±0.5 and 78.8 ±1.0 Ma for bentonite beds sampled immediately above and below the Gammon Ferruginous Member provide a new, precise age bracket for this member. To corroborate and complement these new ages, sanidine or biotite in duplicate bentonite samples are planned to be dated by the $^{40}Ar/^{39}Ar$ method in collaboration with the Alberta Geological Survey. The combined age results for a number of bentonite beds will facilitate correlation of stratigraphic units and creation of a simplified, standardized stratigraphic nomenclature across the Western Canada Sedimentary Basin and with equivalent beds in the U.S. Midwest. This work also facilitates fossil studies by the Canadian Fossil Discovery Centre in Morden.

The Interlake area of Manitoba possesses the required setting for Mississippi Valley-type (MVT) Zn-Pb and kimberlite (possibly diamond-bearing) deposits when compared to other regions. Lake Winnipegosis and South Moose Lake have been the focus of attempts by Klyne Exploration, White Cap Exploration and GEM Oil Inc. to discover such deposits. The MGS continued to assist these companies in their exploration efforts by field visitation and office consultation during 2013/14.

Quaternary

A thorough understanding of surficial geology is essential for mineral exploration and prospecting in drift-covered terrains, including much of Manitoba's northern regions. Here, geochemical and indicator-mineral analysis of till, combined with data on the orientation, timing and nature of ice-flow phases, can provide tools to more accurately locate exploration targets.

In the summer of 2013, Quaternary geological mapping, including sampling of till and measurements of ice-flow indicators, focused on a 3330 km^2 tract of land east and northeast of Southern Indian Lake. Previous Quaternary geology investigations of this large area have been inadequate in scale and detail, thereby necessitating new Quaternary studies to augment understanding of the glacial geology and geomorphology. Results from the 2013 field season and ongoing analytical studies will provide new and better constraints to drift exploration in a region with potential for a variety of commodity types, including diamonds, gold, base metals and pegmatite- and carbonatite-hosted rare-element deposits.

Also in 2013, reconnaissance Quaternary mapping and sampling were conducted in the Gillam area of northeastern Manitoba. Preliminary results from the new field investigations imply that the Quaternary landscape in the Gillam area is complex, with evidence for at least three different cycles of glacial deposition, as well as later inundation by both glacial Lake Agassiz and the Tyrrell Sea. The complex paleoglaciology of the Gillam area warrants a larger field program, which is being planned for 2014.

2. Increasing Manitoba's hydrocarbon geoscience knowledge base

The Shallow Unconventional Shale Gas Project is a multi-year investigation of the shale gas potential of the Late Cretaceous shale strata of southwestern Manitoba. This sequence of rocks was poorly understood prior to this project. The stratigraphic, geochemical and mineralogical information that has been gathered to date has significantly improved our geoscientific knowledge base. This fundamental information can be used by industry in exploratory programs to assists in identifying units in the Cretaceous shale sequences that have promising characteristics for expanding the potential pay zone thickness at any given location, making exploratory drilling more attractive and less risky. With consistent gas shows, high organic content, and predictable porous units, the Favel and Carlile formations are identified as the best shale gas targets, with some potential in the Gammon Ferruginous Member of the Pierre Shale. In 2013, outcrop mapping was conducted to find potential gas reservoir units, and samples were collected for multi-element inorganic and organic geochemistry, and mineralogical analysis. Some research initiatives of this project, including calculating a gas resource estimate, are being conducted in partnership with the University of Calgary.

The GEM Energy: Hudson and Foxe Basins Project end in March 2013. Results from this 5-year project were published in a comprehensive final report, co-authored and released through the Geological Survey of Canada. Locally, an investigation of the detailed sedimentological character and reservoir potential of the Attawapiskat and Ekwan River Formations was conducted in partnership with the University of Manitoba. Results from the GEM Energy project have shown that the Hudson Bay Basin has a widespread distribution of organic source rocks, and has undergone sufficient burial and heating of these source rocks to pass through the oil window, leading to an active hydrocarbon system in this basin. Evidence for oil generation and oil migration has been documented in rocks in Manitoba's Hudson Bay Lowland.

As a natural extension of the GEM Energy project in the Hudson Bay Lowland, the new GEM 2: Hudson Bay and Ungava Project was announced and started its first of seven years of study in April 2013. The aim of this project is to further enhance our understanding of the sedimentological framework and structural complexities in this part of the Hudson Bay Basin to help promote hydrocarbon exploration in this underexplored frontier region. Work in 2013 focused on highly detailed stratigraphic drillcore investigations, including collecting and submitting geochemical and paleontological samples for analysis.

The Devonian Duperow Formation project is in its second year, and is done in partnership with the University of Manitoba, with special funding from ARC Resources Ltd. from Calgary, Alberta. The objective of this project is to investigate the stratigraphy, sedimentology and petroleum potential of the Duperow Formation in southwestern Manitoba. This formation was not well understood in Manitoba prior to this study, thus the new information provides a framework to formalize the stratigraphic nomenclature for Manitoba, but most importantly new information on the petroleum potential of this formation previously unknown. The Duperow Formation is a formation that occurs deeper than any currently producing formation in Manitoba therefore is rarely drilled or cored, and is stratigraphically correlative to the lucrative oil producing Leduc Reefs in Alberta; it also produces oil in Saskatchewan and North Dakota. Results to date on this project indicate that the Duperow has good potential as a conventional oil reservoir, but also shows promise as a self-sourcing unconventional oil target in areas where it is at its deepest in southwestern Manitoba. This new geoscientific information will assist industry with exploration strategies to test the true potential of this formation.

The MGS provides year-round technical expertise to energy clients by responding to inquiries made directly to the geologist gained through contacts at meetings and conferences about geoscientific issues, as they pertain to the exploration and development of oil and gas in Manitoba.

The MGS collaborates continuously with neighbouring jurisdictions and organizations with similar goals, such as the National Energy Board, Geological Survey of Canada, Canada-Nunavut Geoscience Office,

Alberta Geological Survey, Saskatchewan Geological Survey and Ontario Geological Survey, on issues of similar interest, such as stratigraphy and resources investigations.

3. Promoting effective land use and resource management

The MGS participated in the Protected Areas Mining Sector Consultation, reviewing protected areas proposals currently in consideration by government. Main proposals under review in 2013/14 included expansions of Chitek Lake and Little Limestone Lake, land-use category boundary changes for the Hecla/Grindstone provincial park, amendment of the Whiteshell provincial park boundary and land-use category boundaries, protected areas in conjunction with Inuit land claims in northern Manitoba, the Polar Bear provincial park study area, the "Mining in Provincial Parks" strategy, and peatland and caribou draft strategies.

The MGS liaison program provides mineral resource land-use information exchange in partnership with First Nations, remote communities and mineral resource industry representatives in Manitoba. The MGS liaison program developed a relationship-building engagement process to proactively bring people together and help improve respectful communication between the Department and First Nation communities. The reconciling liaison approach encourages mutual sharing of community land-use perspectives and acknowledges the equal value of Indigenous knowledge, community role-models and postsecondary education.

In 2013, the MGS delivered the 'What on Earth' program in Norway House, Oxford House and Gods Lake Narrows. The program, held over a period of ten days in each community, engages Aboriginal youth, integrates Elders traditional knowledge and includes the perspectives of land-use managers. MGS geologists demonstrate how to perform geological field mapping (mineral and rock identification, record keeping, rock sampling, safety and emergency equipment, etc.). Program participants gain a greater awareness of potential careers and jobs available in the mineral resource industry. With input from each community a poster is created that describes the program, displays local geological features and showcases each First Nations' interests. Throughout the liaison program, a staff geologist resides in the community and becomes a contact person with whom community members are familiar with. Liaison through the engagement process provides the framework for open communication during potential land-use development. By proactively developing effective lines of communication, the program promotes community participation in the mineral resource industry and minimizes potential impacts to constitutionally protected Treaty and Aboriginal Rights under Section 35.

The MGS liaison program collaborated with other departments and educational institutions:
- With the University of Manitoba in the development of a new workshop held at the GAC-MAC Winnipeg 2013 conference. This initiative, called First Nations Geoscience, brought together outreach workers, teachers, geological scientists and industry representatives with First Nation Midewiwin Elders to better understand the indigenous perspective of geological sciences and to look at examples of how industry-led programs currently engage First Nation youth.
- Technical assistance by explaining geological information during the consultation process with First Nations in Sagkeeng, Hollow Water, Nisichawayasihk, Bunibonibee, Gods Lake and Tadoule Lake. Information shared by community members and representatives of the minerals industry assists government and community leaders in finding solutions when mineral potential may impact land-use planning.
- Geological field trips in collaboration with the Boreal Forest Nature Centre in the Pine Falls area with several Hutterite communities of southwestern Manitoba.
- Information booths provided at the First Annual Career Fair in Hollow Water First Nation at Wanipigow School, and the Ninth Annual Youth Conference in Gods Lake Narrows First Nation.

4. Evaluation of environmental impacts and geohazards

Manitoba's three-dimensional (3-D) geological model of the Phanerozoic succession is progressing. The model is based upon a series of 134 province-wide 2-D cross-sections between 49°N and 55°N latitudes. These sections, based on data compiled over a decade (including inputs such as Manitoba's water-well, oil-well and stratigraphic-drillhole databases, large lake bathymetry, Lake Winnipeg seismic surveys and surface datasets such as the provincial surficial geology compilation map series), have been released digitally as 'vertical maps' and are available on the Map gallery. Originally, these 2-D sections were imported en masse into our 3-D modelling software, however, it was realized that the sections required

modifications in order for them to be feasible in the 3-D realm. Work has gone into preparing the sections and accompanying data for this purpose. The 3-D geological model and its accompanying 2-D cross-sections unite disparate datasets and put them into a single standardized nomenclature. This work significantly contributes to a variety of geoscience knowledge bases relevant to Phanerozoic stratigraphy, hydrocarbon, groundwater and industrial-mineral resource development, and geological education.

5. Development of products that respond to clients' increasing needs for digital information

The digital mineral deposits and occurrence database for Manitoba has been available on the MGS GIS Map Gallery website since November 2008 and now contains information on 2620 mineral deposits and occurrences. Included in the database is all of the information contained in the reports of the Mineral Deposit Series. Work continued on entry of new data to incorporate recently released work contained in nonconfidential assessment files, as well as public information available on the SEDAR website. Existing records are revised as new data becomes available and, in some cases, records have been deleted where value of the information was in question. Annual updates for each year will be added to the GIS Map Gallery in early November to correspond with the Manitoba Mining and Minerals Convention.

Manitoba Mineral Resources completed redesigning the Map Gallery Internet mapping tool and brought it live on the internet in the fall of 2012. Geoscience Information Services continued to devote resources supporting this new Map Gallery application on the departmental website with additional and updated datasets and continuing refinements of the user interface. One of the key features of the new presentation is the inclusion of the main feature layers of the Mines Branch Map Gallery presentation in the 'Geology of Manitoba' map. This combination of geoscience data and mineral and land tenure information allows the user access to more research information in a single map presentation than in the previous Map Gallery.

Geoscience Information Services continued support for compilation programs, including sub-Phanerozoic Precambrian geology, geology at 1:250 000 and 1:1 000 000 scales, and geophysical data. Geochemical, geochronological and mineral-deposit databases are maintained by this section of the MGS. Geographic-information-system support is a critical component of these projects because of the large volumes of descriptive and analytical data available for the compilations. Geoscience Information Services continued to support the surficial geology mapping programs publishing compilation maps and more detailed maps at 1:50 000 scale.

The geophysical-dataset compilation project involves a collection of the nonconfidential geophysical datasets that were filed for assessment purposes. This ongoing project focuses on expanding the number of datasets and converting the data presentations to standard format, with particular emphasis on converting data to a standard map projection and datum. The compilation now includes 264 geophysical datasets that can be viewed in the Map Gallery 'Geology of Manitoba' project and are available for free download.

Previously, the MGS had successfully compiled and released seamless queryable digital surficial-material maps, but these compilations do not include point and line features. The Manitoba Surficial Digital Data Capture project has digitized all Quaternary line and point data. This data was then updated through mapping that utilized recently-released remotely-sensed imagery. The development of a comprehensive spatial geoscientific database across Manitoba will be of great assistance to the successful interpretation of ice flow and glacial history in Manitoba, as well as to the agriculture, land-use, aggregate, groundwater, environment, hazard and exploration industries, which require current knowledge to make effective decisions.

Manitoba Geological Survey continues to be an active member of the Provincial Spatial Data Infrastructure (SDI) initiative to produce a single province-wide portal to access all digital data produced by Manitoba agencies.

6. Providing minerals industry information through outreach activities

In 2013/14, the MGS published the annual Report of Activities, nine Open File reports, two Geoscientific Reports, one Geoscientific Paper, eight Preliminary Maps, three releases in the Geoscience Education Series and five Data Repository Items. Thirty-seven reports and maps that were previously only available in print or are out-of-print were digitized and re-released on the Mineral Resources website. Most of the

publications continue to be offered in hard copy and on CD-ROM or DVD for purchase through Publication Sales, and in electronic format for free download from the Mineral Resources website. Technical oral presentations were given at various conferences, which targeted working professionals in academia, industry and business sectors.

Complementing a new Manitoba Rocks! website – ManitobaRocks.info, (launched in 2013), the MGS 'Manitoba Rocks!' mineral-education program continues to deliver fun, free activities and school tours at the Manitoba Mining and Minerals Convention. The program offers Grades 4-7 students an opportunity to learn more about the province's 2nd largest primary resources industry through Rock Doc presentations, gold panning, professional rock and mineral displays, an end use minerals display, mineral and fossil collecting, gold-panning activities at Children's Hospital, and more. MGS geologists and Client Services staff contributed to Outreach in 2013 through increased awareness-building activities and educational visits to northern communities, including a Manitoba Rocks! information booth and classroom presentations held during Career Day events in Norway House, The Pas, and Thompson, which were attended by hundreds of students. Throughout the year, and on a volunteer basis, MGS staff geologists continue to deliver in-class presentations to grade 4 students in support of Manitoba's school curriculum and studies about rocks and minerals.

The Joint Annual Meeting of the Geological Association of Canada and the Mineralogical Association of Canada (GAC-MAC), Canada's premier geoscience conference, was held in Winnipeg from May 22 to 24, 2013. The Manitoba Geological Survey played a significant role in organizing this event, in conjunction with the University of Manitoba, University of Winnipeg and the Manitoba Museum. Survey staff chaired the Technical Program, Field Trips and Transportation subcommittees of the local organizing committee, which entailed a significant commitment during the past three years. The diverse technical program offered four symposia and 30 special and general sessions spanning the gamut of Earth-science research and teaching in Canada and internationally. The well-attended field trips covered many aspects of Manitoba geology, including gold deposits in the Rice Lake mine trend, VMS and gold deposits at Snow Lake, magmatic Ni-Cu-PGE and chromite deposits in the Bird River belt, VMS deposits in the Flin Flon camp, the Ordovician–Silurian boundary interval in the Williston Basin, and the geology of the Manitoba Legislative Building. More than half of the field trips were organized by MGS technical staff and thus required a major commitment of MGS resources in the five months leading up to the conference. Eight of the resulting field-trip guidebooks are available for free download from the Mineral Resources Division website. By all accounts, GAC-MAC Winnipeg 2013 was a very successful meeting, and brought more than 740 national and international geoscientists together "at the centre of the continent".

Map Legend **Location of 2013/2014 Manitoba Geological Survey Projects**

1 Preliminary results of bedrock mapping at Oxford Lake, northwestern Superior province, east central Manitoba

2 Preliminary results of bedrock mapping in the northeastern Cauchon Lake area, eastern margin of the Pikwitonei granulite domain, central Manitoba

3 Preliminary results of bedrock mapping in the Partridge Crop Lake area, eastern margin of the Thompson nickel belt, central Manitoba

4 Preliminary bedrock geology of the eastern extension of the Rice Lake mine trend, Rice Lake greenstone belt, southeastern Manitoba

5 Cat Lake-Euclid Lake area in the Neoarchean Bird River greenstone belt, southeastern Manitoba: preliminary results of bedrock geological mapping and their implications for geodynamic evolution and metallogeny

6 Geological investigations in the Rail Lake-Sewell Lake area, Flin Flon–Snow Lake greenstone belt, west central Manitoba

7 Rare-metals scoping study of the Trans-Hudson orogen, Manitoba

8 Rare-earth element potential of the Gammon Ferruginous Member of the Upper Cretaceous Pierre Shale in southwestern Manitoba

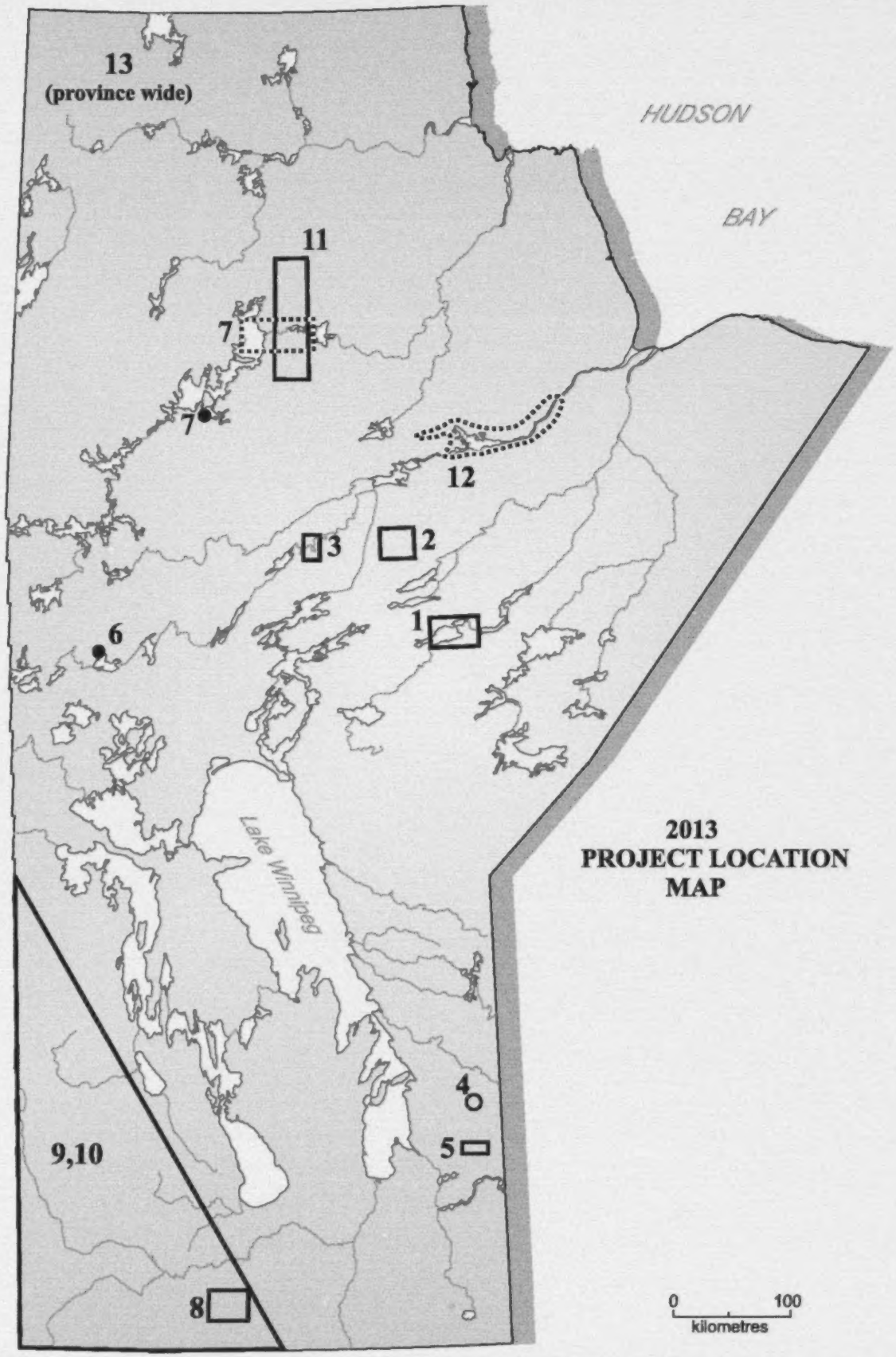
9 Radiometric dating of Late Cretaceous bentonite beds in southwestern Manitoba

10 Preliminary stratigraphic correlation of subsurface and outcrop sections of the Favel Formation, southwestern Manitoba

11 Quaternary geology between Gauer Lake and Wishart Lake, north-central Manitoba

12 Preliminary Quaternary geology in the Gillam area, northeastern Manitoba

13 Bridging land-use perspectives: understanding First Nations industrious participation in northern Manitoba's historical economy



2013
PROJECT LOCATION
MAP

18-2(a) Manitoba Geological Survey

Expenditures by Sub-Appropriation	Actual 2013/14 $(000)	Estimate 2013/14 FTE	Estimate 2013/14 $(000)	Variance Over (Under)	Expl. No.
Total Salaries & Employee Benefits	3,807	54.10	3,946	(139)	
Total Other Expenditures	2,137		2,005	132	
Total Sub-Appropriation	**5,944**	**54.10**	**5,951**	**(7)**	

MINES

OBJECTIVES

The Mines Branch administers legislation governing the disposition of mineral rights (permits, claims and leases), exploration, development, production of the province's non-fuel mineral resources and rehabilitation of mines and quarries. The Branch comprises three sections; Mining Recording, Mining Engineering and Inspection, and Assessment.

ACTIVITIES/RESULTS

Other activities performed by the Mines Branch staff included the continuing compilation of an inventory of the province's aggregate resources and administration of provincial land-use policies that deal with the conservation of mineral resources. The Branch continues it's representation on the sub-committee of IGWG on Mine Environment Neutral Drainage (MEND) Committee, the Green Mining Initiative (GMI), the Federal/Provincial Technical Committee on Mineral Statistics, the Provincial/Territorial Mining Rights Committee and National Orphaned and Abandoned Mines Initiative (NOAMI). Branch staff participated in a number of technical seminars, conferences and mine rescue competition. Staff are also involved in supporting Aboriginal Consultation for issuance of mineral dispositions and work permits.

Under the Orphan and Abandoned Mine Site Program, total expenditures for FY 2013/14 were $45.9 million. In 2013, rehabilitation work was focused on large projects in Sherridon, Lynn Lake, God's Lake and Ruttan. A total of 28 of 31 high hazard sites have been rehabilitated while the remainder will be completed in 2014.

Mining Recording Section

The Mining Recording office is located in Winnipeg with a Claims Inspector in Flin Flon.

The Mining Recording Office maintains up-to-date records of mineral dispositions and leases and all legal transactions that relate to mineral dispositions and leases as required by legislation. Computer terminals are available for the general public to access disposition information on mining claims and permits, quarry leases, quarry surface leases, quarry exploration permits and potash dispositions.

The Mining Recording Section processes applications for mineral dispositions, leases, monitors and inspects the activities of disposition and lease holders for compliance with requirements of *The Mines and Minerals Act* and Regulations, and collects fees, rentals, royalties, rehabilitation levies, taxes and cash security deposits payable under the Regulations. The total revenue collected by the Section during the fiscal year 2013/14 was $3,240,181.12 and the rehabilitation levy collected on the removal of aggregate material was $2,28,510.08 for the same period.

During the calendar year 2013, 456 mining claims, 0 mineral leases and 20 mineral exploration licenses were recorded covering a total of 273,188 hectares. Concurrently, 142 quarry mineral leases, 864 casual quarry permits and 752 registration certificates for private pits and quarries were also issued during the same period. Details of the types of mineral dispositions and leases issued and in good standing in 2013 are shown on the following page.

Since its introduction in 2012, Integrated Mining and Quarrying System (iMaQs) has enabled registered clients to submit applications and manage their dispositions online. iMaQs has allowed the public to gather more information through maps and search functions. Users of the system can view disposition data including their status as well as open assessment reports. Currently, iMaQs is capable of accepting applications for mining claims, mineral leases, surface leases, mineral exploration licences and private pit registrations from external client users. Users also have the ability to submit reports of work, allocate work credits, and apply for relief from forfeiture, notice for airborne survey and borehole licence. iMaQs is continually being improved to include allowing clients to submit and manage their applications in quarrying at the convenience of their own computers.

Crown - Aboriginal Consultation

Mineral Resources is responsible for Crown-Aboriginal consultation on mineral exploration licences and on work permits which are issued by Manitoba Conservation and Water Stewardship for mineral exploration and development activities. The department is also the lead agency for Crown-Aboriginal consultation on Environment Act licences for mine developments. The department has established Crown-Aboriginal consultation procedures to guide the consultation processes.

Before a company can carry out exploration activities on a mineral disposition or lease, they have to obtain a work permit issued by the local regional office of Conservation. The majority of work permits are approved for issue by Conservation within 60 days. Once an application for a work permit is received, it is forwarded to the Mines Branch (MMR) who are responsible for carrying out Crown-Aboriginal consultation with Aboriginal communities whose treaty and Aboriginal rights may be adversely affected by the activities.

Mineral Resources has developed an on-line "Approvals Tracker" which allows applicants to follow their applications for work permits and mineral tenure through the government approvals process.

Work Permit Applications Processed by Mineral Resource Division in 2013/2014:

Number of Work Permit Applications Processed	46
Number of First Nations / Aboriginal communities consulted	24
Average number of days between receiving a Work Permit Application and providing Conservation with notice to issue the permit	29
Applications withdrawn by Company/Individual	1

MINERAL DISPOSITIONS ISSUED EACH CALENDAR YEAR 2010 – 2013

	2010		2011		2012		2013	
	No.	Hectares	No.	Hectares	No.	Hectares	No.	Hectares
Mining								
Mining Claims	341	73,574	410	85,952	493	106,668	456	94,479
Mineral Exploration Licences	4	80,685	20	253,237	11	105,435	20	178,709
Mineral Leases	-	-	-	-	3	1,637	0	0
Quarrying								
Leases	146	7,326	95	6,832	48	2,090	142	7,126
Exploration Permits	10	56,884	15	3,480	0	0	0	0
Casual Quarry Permits	852	-	889	-	933	-	864	-
Peat*								
Leases	14	1,995	32	5,037	0	0	0	0
Exploration Permits	-	-	-	-	-	-	-	-
Coal – Exploration Permits	10	56,884	13	3264	-	-	-	-
Private Aggregate Registration Certificates		772	786		796	-	752	-

MINERAL DISPOSITIONS IN GOOD STANDING AT CALENDAR YEAR END 2010 - 2013

	2010		2011		2012		2013	
	No.	Hectares	No.	Hectares	No.	Hectares	No.	Hectares
Mining								
Mining Claims	6,142	989,444	5,783	905,218	5,926	932,434	5,536	897,862
Order-In-Council Leases	3,653	120,562	3,653	120,562	3,653	120,562	3,653	120,562
Mineral Exploration Licenses	75	1,395,011	55	797,545	50	791,740	45	541,363
Mineral leases	253	23,416	252	23,532	255	25,169	51	16,642
Potash								
Leases	1	5,787	1	5,787	1	5,787	1	5,787
Exploration Permits	3	127,431	3	127,431	0	0	0	0
Quarrying								
Leases	1,131	63,503	1,154	66,130	1,148	68,148	1,249	73,896
Exploration Permits	33	178,804	32	59,868	0	0	0	37,618
Peat*								
Leases	173	27,663	202	31,977	0	0	0	0
Exploration Permits	-	-	0	0	0	0	0	0
Coal – Exploration Permits	19	74,280	30	59,660	0	0	0	0
TOTAL	11,483	942,398	11,165	2,197,710	11,033	1,943,840	10,534	1,693,730

*A two year moratorium on new peat leases was enacted in June of 2011 and extended to June 15, 2015. Responsibility for the management of Peat will transfer from The Mines and Minerals Act to The Peatlands Stewardship and Related Amendments Act when that Act is proclaimed.

Mining Engineering and Inspection

The primary purpose of the Mining Engineering and Inspection Section is to facilitate and encourage sound exploration, mining and rehabilitation practices in the province consistent with the principles of sustainable development and in compliance with *The Mines and Minerals Act*. It also provides land management and advisory services in support of provincial legislative and regulatory land use and resource management initiatives.

Staff monitor mining activity in Manitoba to ensure compliance with requirements under *The Mines and Minerals Act* including licenses, registrations, permits, leases, closure plan submissions, royalty/levy charges on production, and environmental operation standards. Inspection staff conducted field inspections to ensure mining compliance at quarry lease and casual quarry permit locations, private pit/quarry operations and site rehabilitation projects.

The Mines and Minerals Act, proclaimed in 1992, introduced a program to address the rehabilitation of pits and aggregate quarries in the province. Aggregate producers pay an annual levy based on the tonnes that they've produced and this money is set aside in a fund to be used for pit and quarry rehabilitation. On the basis of aggregate production from private and Crown lands in fiscal year 2013/14 approximately $2.5 million was contributed to this Quarry Rehabilitation Fund, while 91 rehabilitation projects were completed at a cost of $3.3 million. The total number of projects completed since 1992 comprise approximately 9,383 hectares of land rehabilitated. All the work has been undertaken through private equipment rental agreements or tendered contracts with private operators, administered and monitored by branch inspection staff.

Orphan and Abandoned Mine Site Program

Under the Orphan and Abandoned (O/A) Mine Site Program, total expenditures for FY 2013/14 were $45.8 million. The rehabilitation work focused on large projects in Sherridon, Lynn Lake, God's Lake and Ruttan. To date 28 of 31 high hazard sites have been rehabilitated with the remainder to be completed in 2014. Work continued on high priority sites - Sherridon, Lynn Lake and God's Lake with substantial completion in 2013. Rehabilitation construction commenced at Ruttan Mine Site located near Leaf Rapids.

Significant progress was made under the O/A Mine Site Rehabilitation Program in 2013/14 with the following work carried out:

- Farley Tailings Management Area in Lynn Lake – The rehabilitation work at Farley with Viridian was completed in December 2012. A financial agreement was reached with Viridian at the end of 2012, where a payout was made to the Province to complete the final phase of the remediation work. The final phase of this work involves the installation of a "B" Cover over area 10 at the Farley Tailings Management Area which will be complete in the second quarter of 2014.
- Sherridon Tailings –Flooding of Camp Lake was completed in 2013. Treatment of Camp Lake was continued during the summer operating season to neutralize the pH level. In the spring of 2014 lime was placed on the ice to raise the pH and help stabilize Camp Lake. Planning is underway for de-mobilization of the treatment plant and completion of final construction activities.
- Snow Lake – An agreement was signed between Manitoba and BacTech to look at the feasibility of reprocessing of tailings to treat arsenic and recover gold using the company's proprietary bioleaching technology. BachTech have been granted an extension to the end of 2014 to prove the process.
- Elk Island - The remediation work at the Elk Island Air Strip was substantially complete during 2013/14. This work was completed by God's Lake First Nation (GLFN) and Arnason Industries joint venture.
- Ruttan Mine Site - Engineering work and concepts were completed in 2011. A total of 9 tender packages were developed for the rehabilitation work. The purpose of the smaller work packages was to allow northern contractors and each First Nation the opportunity to bid on the work. Tender documents required 15-25% First Nation and local involvement in the work. Construction work continued on the old hoist building which will house the water treatment plant. Commissioning of the plant was scheduled for the spring of 2014. Capping of the Tailings Management Area commenced and work continued through the winter season. Capping of the

tailings is scheduled for completion in 2015. Low / Moderate Sites - Ten (10) exploration sites located in Whiteshell Provincial Park are scheduled for rehabilitation in 2014/15. Contracts have been awarded for this work.

Sustainable Land Planning Services

Manitoba has enacted several land use, environmental and resource management acts targeted at managing land and natural resources, creating economic development opportunities and protecting critical habitat and large sustainable ecosystems. The provincial outcome is responsible mining activity that significantly contributes to Manitoban's economic and social prosperity. The mineral resource/land management program facilitates mineral resource and land stewardship in the various federal, provincial and municipal land and resource use management planning and permitting processes. Program objectives are to help facilitate the provincial interest in natural resources, manage surface and Crown mineral land, and facilitate responsible mineral extraction that does not impair ecosystems and damage threatened habitat. Manitoba has a dual system of land tenure and significant effort is placed upon minimizing land access and use conflicts and also provide high quality advisory services to industry, planning authorities, municipalities, and land management stakeholders.

Crown Land Planning

The management, classifying and land use policy development in Agro-Manitoba is the responsibility of the Bloc Panning Committees. Major activities of the Crown land management process include developing and implementing multi-resource land use plans, developing Crown land use codes and supervising land use on Crown lands through an integrated management process. Other significant initiatives include assessing Crown land sales and use proposals, providing technical advice and information on resource management activities. Highlights include developing a model for aggregate extraction and processing within Forestry areas, Wildlife Management Areas and other designated Crown land. Land access to aggregate deposits on Crown mineral land is becoming more challenging.

A pre-cleared list of aggregate extraction areas for casual quarry permits has been created in response to the infrastructure deficit. Land management provides planning services related to:

- Crown land sales
- Crown land exchanges
- Crown land planning and development
- allocation of use
- integration of use
- protection, conservation and stewardship of provincial natural resources
- designation of Crown land for provincial parks, ecological resources, wildlife management areas, etc.

All land sales, exchanges, land use codes and other administrative requirements for Crown land planning and management are reviewed and technical advice is provided.

In addition to the above, Manitoba has initiated support and a new process for provincial Crown land management which includes the Assistant Deputy Ministers and Deputy Ministers land use committees. Land Management also provides technical and policy support to these new land management processes.

A review of the *Crown Lands Act* has been initiated.

Municipal Planning

The Planning Act governs land use planning and development in Manitoba. The legislation provides municipalities and planning districts with the authority to create and adopt a Development Plan and Zoning By-law. Land management is actively involved in providing the legislatively based land planning processes and stakeholders with technical products, advice and technical positions on land planning matters within the context of facilitating the public interest. Support services include reviewing policy and development proposals and ensuring that the province's non-renewable mineral resources are not sterilized by development, preparing technical reports and maps that help facilitate mineral resource management, and providing professional planning advisory assistance to the subdivision review and

conditional use processes. Staff participated in four Municipal Board Hearings representing the provincial interest in planning matters.

Other significant planning services include policy reviews of plans and zoning by-laws, public consultation and supporting planning appeal Boards. Land Management is responsible for the interpretation and application of Provincial Land Use Policy #8, MR 81/2011. The Provincial Land Use Policy for minerals has been revised to strengthen its intent and provide clarity concerning protecting mineral resources and facilitating responsible development. The regulation has recently been vetted through Interdepartmental Review Committee and was proclaimed in June 2011. Aggregate resources are becoming increasingly scarce in the Capital Region and special emphasis has been placed on designating critical resources for future mining activity, and ensuring that the resources are viable for infrastructure renewal. Lands containing moderate to high quality mineral deposits are designated for mining activity and protected for future extraction. Development pressure from residential development has created a serious land use conflict due to the transition from rural and agriculture to a semi-urban environment. Permitting for new sources of aggregate has become a serious land use issue and the challenge is to find viable sources in support of the infrastructure deficit. Urbanization within capital regions municipalties has sterilized many of the high quality deposits and as permitted aggregate sites are depleted new sources are becoming difficult to open up.

Sustainable Land Planning Services

	2011	2012	2013
Reviews of new Development Plans and by-law amendments to ensure that mineral resources are not sterilized	138	137	126
Municipal Boundary reviews including annexation or expansion	2	2	4
Review of new zoning by-laws and amendments	163	144	176
Review of closure of roads and public reserves	30	45	43
Review of conditional use applications for the establishment of mining operations	15	17	13
Review of proposed live stock operations	4	2	1
Provide land planning services to 46 planning districts and 144 municipalities			

Land Use Assessment

Land Management provides technical support and advice to many land use resource reviews and assessment processes. Land use proposals are assessed to ensure that the province's mineral resources are not sterilized by development and to ensure that land use conflicts are identified and mitigated. Land use proposals that are assessed are subdivision applications, Crown land sales, zoning and policy memorandum as well as Crown surface encumbrances with the view of documenting land use, tenure and environmental conflicts. This activity directly supports interdepartmental and intergovernmental planning and resource management activities within an integrated management process. A total of 1365 land use proposals were assessed for potential land use conflicts to ensure that the Province's mineral resources were not sterilized by surface development. A new policy and procedure and related process was created and implemented for mineral access rights. In addition, Land Management has partnered with development proponents in large complex surface, mineral and sand and gravel rights ownership to document and interpret various tenures and to help resolve ownership concerns. A new process was initiated to streamline the subdivision review process in partnership with Manitoba municipalities and other stakeholders. The intent is to find efficiencies in the administrative process and be more responsive to public needs. The improvements were codified in the subdivision regulations.

Sustainability

The Sustainable Development Act was proclaimed on July 1, 1998. The Act creates a legal framework through which sustainable development will be implemented in the public sector and encouraged in private industry and society. In addition, the principles of sustainable development have been codified in *The Mines and Minerals Act* and provide the legal framework for implementing sustainability on Crown mineral land. An implementation process has been recently initiated and approved by Manitoba, and land

management is currently providing technical support to many different provincial working groups and processes. Technical support is provided to COSDI, sustainability reporting, and recently adopted "Green Plan". Other important initiatives include sector based strategies under the provincial land and water initiative. Land Management also provides technical support to the Sustainable Development Innovations Fund by reviewing technical reports and participating in the approving committee. The principles of sustainable development are being codified into Municipal Plans, Crown Land plans and Zoning By-laws. Technical support for the Green Mining Initiative was also facilitated. The main priority is to demonstrate that new technology can be used to minimize mining sector ecological footprint. New program development is being developed in response to the Green Plan.

Protected Areas Initiative

Manitoba has initiated a program to protect representative landscapes and ecosystems from logging, mining and hydro development. Mines Branch plays an important technical role in the process by legally withdrawing Crown mining rights from mineral exploration, development and extraction to protect critical habitat from mining activities. It also provides land tenure information and other support to the stakeholder approval process. A new policy and process for protecting Rank 1 Crown mineral rights from exploration and development was implemented. The intent is to provide comprehensive legal security to the protected areas lands and ensure that they are protected until the stakeholder consultation process is completed. Some of the land requests for protected areas status have been re-assigned to the Bloc Planning Committee. Special effort has been targeted to improve the mining sections involvement in the Endangered Species and Habitat Protection Act. A new process and relationship is being conceptualized.

Treaty Land Entitlement

Progress was made towards meeting provincial obligations for Treaty Land Entitlement, Northern Flood Agreement and Grand Rapids Forebay Agreement in accordance with these legal agreement requirements. Land selections containing valid mineral dispositions in good standing were documented and technical support to the selection process was provided. Staff participated in resolving tenure conflicts associated with land selections and also provided procedural and policy advice. Twenty-two selection sites were ratified covering a total of 2,848 acres.

Public Outreach

Land Management also provide educational and outreach services facilitating sustainability, mineral resource management to various land management boards, municipal councils, industry and the public. Public outreach services include presentations, workshops, and internet access to land management issues, policies, practices to ensure that there is an opportunity for public involvement and discussion regarding resource management issues. Activities include oral and poster presentations at conferences, workshops, public meetings and direct stakeholder consultations concerning mineral resource management. This activity helps facilitate informed decision making by land management boards, industry, and the public. Highlights for 2013 include providing public outreach to Manitoba's cottage lot program, Manitoba Mining Association workshop on mineral access rights, assisting Manitoba prospectors and First Nation groups in land tenure issues, and providing technical support to Watershed Management Boards. This year special emphasis has been placed on conducting workshops on land planning and mineral tenure with stakeholders at the Manitoba Planning Conference. In addition, a new strategic partnership has been created to improve mineral extraction within forestry areas leading to an improved integrated management framework where all values are considered and addressed. Staff also participated in the off-road vehicle process.

Future Direction

Manitoba has embarked in a new direction by creating the "Green Economy". New initiatives include the "Green Plan", Endangered Species Act, and the revision of the Sustainable Development Act. Our emphasis will be to reduce the ecological footprint left by mining activity and help protect endangered species and habitat while maintaining a healthy and prosperous mining sector.

Assessment Section

The Section receives and evaluates reports of required work submitted under *The Mines and Minerals Act* to ensure compliance with legislation and acceptable industry standards. At first confidential, these reports are eventually transferred to the non-confidential assessment library open to the public. These reports are indexed, microfilmed and scanned. Clients can view reports in our office or on the website.

Copies can be obtained by printing them directly from the website or ordering them from the Assessment Library. These reports are available on line, on paper, microfilm or compact disc.

The Section also provides advice to the Review Panel and Administrator of the Mineral Exploration Assistance Program on the merits and validity of the projects, acceptance of final reports and recommendations on payment or non-payment of grants.

The Section monitors mining exploration activities in the province and contributes to the preparation of reports on industry activity. It also acts as liaison between Natural Resources Canada and the mining industry for the gathering of statistics on exploration and production.

At the request of the Manitoba Securities Commission, the section reviews technical submissions on mining projects to ensure that they conform with the reporting standards set out in National Instrument 43-101 - Standards of Disclosure for Mineral Projects. No projects were reviewed during the past year.

	2010	2011	2012	2013
Reports of work added to assessment library	125	126	131	95
Reports transferred to non-confidential status	99	119	117	136
PRIVATE SECTOR:				
Visits	41	15	9	4
Reports examined	50	58	104	64
Reports duplicated for clients	8	36	25	50
CD'S duplicated for clients	1	0	1	1
DEPARTMENTAL STAFF:				
Reports examined	13	2	2	1
Microfiche created/duplicated for Winnipeg and Northern Offices	100	0	0	0

Note: The decline in office visits and other activities in the private sector is due to the fact that all information is now available on-line.

18-2(b) Mines

Expenditures by Sub-Appropriation	Actual 2013/14 $(000)	Estimate 2013/14 FTE	Estimate 2013/14 $(000)	Variance Over (Under)	Expl. No.
Total Salaries and Employee Benefits	1,266	25.50	1,341	(75)	
Total Other Expenditures	4,307		658	3,649	*1*
Total Sub-Appropriation	**5,573**	**25.50**	**1,999**	**3,574**	

1. Environmental Liabilities

PETROLEUM

OBJECTIVE

To provide for and encourage the safe and efficient development of Manitoba's oil and gas resources in accordance with the principles of sustainable development.

ACTIVITIES/RESULTS

Manitoba's oil and gas sector, though small by national or international standards, is a significant component of the provincial economy particularly in the southwestern part of the province.

In 2013, Manitoba produced 3,053,838 cubic metres or 19.2 million barrels of oil having a total value of approximately $1.76 billion breaking all previous investment, drilling, and production records. Since there are no refineries in Manitoba, the majority of the province's production is exported through the Enbridge pipeline system to refiners in Ontario and the US. In 2013, an estimated 322,330.8 m^3 (1,060,407 barrels) or 10.6% of Manitoba's oil production was transported by rail to locations in eastern Canada and the US.

In 2013, the petroleum industry spent $1.3 billion in Manitoba to explore for and develop Manitoba's oil and gas resources, drilling 537 new wells and operating over 4824 producing wells.

In 2013, the Daly-Sinclair, Virden, Manson, Birdtail, Pierson and Waskada Fields continued to expand. As of December 31, 2013, our biggest field, the Daly Sinclair field had over 2031 producing oil wells and contributed 41 % of the total provincial production.

The Waskada Field experienced continued drilling during 2013. Originally developed in the early 1980's using vertical technology, this field is still being redeveloped and expanded using new horizontal technology and currently accounts for 28.8 % of Manitoba's 2013 production.

Since 2009, Manitoba's oil production has risen by 200% to approximately 8,366m3 or 52,653 barrels of oil per day.

In 2012 PennWest Petroleum received approval and began construction of a gas plant at their existing 11-30-1-25 WPM battery. That plant is now operational and removing natural gas liquids from the solution gas stream, reducing the volume of gas incinerated and flared. The gas plant is designed to process up to 200,000m^3 of gas per day (7mmscf/d) and is planned to produce about 217 cubic meters per day of condensate (1,400 bbl/d). Together the PennWest plant and the EOG gas plant result in a combined 30% reduction of gas flaring in the Waskada Field.

It is estimated that the petroleum industry in Manitoba provides direct and indirect employment for approximately 5000 Manitobans.

In 2013/14, royalties, production taxes and revenue from the administration of Crown owned oil and gas rights, fees and sundry added $ 19.8 million to the provincial revenues. Significant revenues were also collected by the province through income taxes, retail sales tax, corporation capital tax, payroll tax and fuel taxes. In addition, the industry paid approximately $11.7 million in property taxes to the various municipalities where oil wells and facilities are located. The industry expenditures of $ 1.3 billion generated $155 million in direct and indirect tax revenue for the province.

The Petroleum Branch administers The Oil and Gas Act and related regulations governing the exploration, development, production, transportation and storage of crude oil and natural gas. The branch is also responsible for The Oil and Gas Production Tax Act. Additionally, officers and inspectors of the branch are designated as Workplace Safety and Health Officers under The Workplace Safety and Health Act with respect to oilfield operations. The inspectors also act as industry's first point of contact with regard to oil field related environmental issues.

The branch continued maintenance of its GIS Web-enabled Petroleum Resources map. The map covers southwestern Manitoba including Townships 1-22; Ranges 19-29 W1 and shows provincial Crown oil and

gas rights mineral ownership, Crown oil and gas dispositions, wells, oil and gas facilities, field boundaries, topography orthophotos and allows for download of the branch's technical well files. The map is available on the Petroleum website at www.gov.mb.ca/petroleum.

The branch participated in the following consultation and outreach activities during 2013/14:

- The 21st International Williston Basin Petroleum Conference (May 20-22, 2013) in Bismarck, North Dakota. The Mineral Resources Division presented an update of Manitoba oil and gas exploration and development activity at this forum and met with industry clients.
- The Canadian Association of Petroleum Geologists Annual Convention (May 12-14, 2013) in Calgary, Alberta.
- Canadian Flare and Venting Regulators Forum Annual meeting on October 21-23, 2013 in Edmonton AB to review current and future regulatory needs for the handling of flare and vent gasses.
- Conducted working group meetings with Canadian Association of Petroleum Producers and the Explorers and Producers Association of Canada regarding the effectiveness of the Manitoba Drilling and Incentive Program with a final meeting on April 24, 2013.
- Intergovernmental tenure committee meeting and CAPL conference on September 14-17 in Toronto
- Participated in Petroleum Services Association of Canada town hall meeting on October 21, 2014, in Brandon providing information on pressure pumping in the oil and gas industry.
- Attended and presented to the Canadian Association of Oil Well Drilling Contractors on Manitoba regulatory requirements at the CAODC fall conference in Nisku, AB on September 11 to September 13, 2014.

The following Informational Notices were issued by the Petroleum Branch in 2013:

- Informational Notice 13-1: Annual Report Abandonment Reserve Fund
- Informational Notice 13-2: Potash Disposition Area Amendment
- Informational Notice 13-03: Manitoba Drilling Incentive Program
- Informational Notice 13-04: Schedule of Public Offerings of Manitoba Crown Oil and Gas Rights - 2014
- Informational Notice 13-05: Digital File submission
- Informational Notice 13-06: Proposal for changes to the Manitoba Drilling Incentive Program - September 6, 2013
- Informational Notice 13-07: Revisions to the Manitoba Drilling Incentive Program – Dec 31, 2013

Administration and Geology Section

Administration

Administration is responsible for collection of petroleum revenues and administration of Crown owned oil and gas rights. The section collects annual lease rentals, Crown oil royalties and freehold oil taxes, conducts sales of Crown oil and gas leases and exploration reservations and processes lease renewals and extensions. The section is responsible for administering provisions of the Crown Disposition Regulation, the Crown Royalty and Incentives Regulation, the Oil and Gas Lease Agents Regulation and portions of the Drilling and Production Regulation under The Oil and Gas Act. The section also administers The Oil and Gas Production Tax Act and Regulation.

Crown Oil and Gas Rights - Four Crown oil and gas lease sales were held in 2013/2014. Fifty-six Crown Leases covering 5,807 hectares were sold for a total of revenue of $2,165,743.96. Revenue collected from Crown oil and gas lease sales was down from the 2012/2013 revenue by $1,890,263.49.

Since 1979, the Province has collected over $92.0 million from the disposition of Crown Oil and Gas Rights. As of December 31, 2013, 119,706.0 hectares of Crown Oil and Gas Rights were under disposition. Compared to 2012, the total area under disposition has decreased by 7.7%.

In 2013, the section processed 104 lease renewals and 35 lease extensions, 119 lease surrenders, 154 transfers of dispositions and 49 oil and gas lease agent renewals and registrations. The section also issued 51 new leases and conducted 9 private sales.

Data Collection - The section collects monthly oil production data and data on the disposal and injection of salt water for all active wells in the province. As of December 31, 2013, there were 5,740 non-abandoned wells in Manitoba. Digital production, logs, technical information and injection histories are available for all wells.

During 2013/14, the section collected $19.8 million from the petroleum industry. This revenue comprised $10.7 million in Crown oil royalties, $6.0 million in freehold oil taxes and $2.6 million from administration of Crown Oil and Gas Rights, fees for well licences, battery operating permits, geophysical licences and oil and gas lease agent registration and publication sales. The revenue collected in 2012/13 was $21.8 million.

Manitoba Drilling Incentive Program, (1992-2013) - The Manitoba Drilling Incentive Program has been revised and extended for the period January 1, 2014 to December 31, 2018. The revised program continues to provide licensees of wells drilled after January 1, 2014, with a holiday oil volume on production, and introduces a new maximum crown royalty rate of 3.0% and a maximum production tax rate of 1.0% payable during the production of holiday oil volumes. With the revised Manitoba Drilling Incentive Program, Holiday Oil Volume Accounts will be phased out by January 1, 2015. Companies will be allowed to assign a one-time maximum of 2,000 cubic metres of Holiday Oil Volume from their Holiday Oil Volume accounts to vertical or horizontal wells drilled between January 1, 2014 and December 31, 2014.

Holiday oil volumes of up to 8,000 cubic metres can be earned by a new well.

In 2013, 371 wells earned an average holiday oil volume of 9,811 cubic metres, bringing the total number of wells that earned a holiday oil volume in the program to 4,381 as of December 2013.

Any horizontal well drilled after to January 1, 2014 receives a holiday oil volume of 8,000 cubic metres. Four hundred and ninety-eight horizontal wells were drilled in 2013.

The Vertical Well Incentive replaces the previous New Well Incentive. Under the Vertical Well Incentive a newly drilled vertical development well, or an exploratory well drilled less than 1.6 kilometres from a well drilled to the same or deeper zone will earn a holiday oil volume of 500 cubic metres.

The Exploration and Deep Well Incentive replaces the existing Deep Drilling Incentive. Under the Exploration and Deep Well Incentive a non-deep exploratory well that is drilled more than 1.6 kilometres from a well drilled to the same or deeper zone will earn a holiday oil volume of 4,00 cubic metres. A deep exploratory well drilled below the Birdbear Formation, or a deep development well completed for production in the Birdbear or deeper formation would earn a holiday oil volume of 8,000 cubic metres.

Thirty-two vertical wells were drilled in 2013.

A marginal well where a workover is completed after January 1, 2014 earns a 500 cubic metre holiday oil volume. A marginal well is defined as a well that, over the previous 12 months, has been shut-in or has an average production rate of less than 3 cubic metres per operating day. The qualifying minimum investment level for workovers has been raised to $75,000.00. Major workovers include the re-entry of abandoned wells, deepening or recompletion of existing wells from one pool to another, horizontal well workovers and the repair of the casing in a well. No wells earned a holiday oil volume in 2012.

The Manitoba Drilling Incentive Program recognizes the higher investments, operating costs and the risks that are associated with a project of enhanced oil recovery (EOR) other than waterflood projects, and now companies may apply under subsection 189(2) of the Oil and Gas Act and subsection 2(2) of the Oil and Gas Production Tax Act for a variation or waiver of Crown royalty and/or production tax for EOR projects.

The Pressure Maintenance Project Initiative replaces the existing Injection Well Incentive. The Pressure Maintenance Project Initiative provides a twelve month exemption from the payment of Crown royalty or production tax on production allocated to a unit tract in which a well has been drilled or converted to

injection within an approved new or modified pressure maintenance project. If a well is placed on injection before it has produced its holiday oil volume and within five years of the finished drilling date, the exemption period will be extended to eighteen months. Under the Injection Well Incentive at December 31, 2013 a total of 120 wells had qualified for the injection well incentive since the inception of the program and there are two wells remaining in the program..

A new Solution Gas Conservation Incentive was introduced whereby no Crown royalties or production tax is payable on captured gas from new solution gas conservation projects which were initiated and approved after December 31, 2013. The exemption from payments of Crown royalties or production tax would apply from the project implementation date to December 31, 2018.

Performance Deposits and the Abandonment Fund Reserve Account – The section administers trust accounts for performance deposits and the Abandonment Fund Reserve Account. Applicants for licences or permits issued under The Oil and Gas Act are required to submit a performance deposit to ensure operations comply with the Act and regulations. These deposits are held in trust until required rehabilitation work has been completed. In 2013/14, approximately $3.2 million in cash, term deposits and letters of credit were administered.

The Abandonment Fund Reserve Account is established under The Oil and Gas Act. Non-refundable levies on geophysical and well transfer of well licenses, battery operating permits and inactive wells are deposited in the account. The account is used as a source of funds to operate or abandon a well or facility that is in non-compliance with the Act, where the licensee of the well or facility fails to do so. The account can also be used to rehabilitate the site of an abandoned well or facility or to address any adverse effect on property caused by a well or facility. Any expenditure from the account on behalf of a licensee automatically creates a debt of the licensee to the Crown, recoverable in court.

An annual report of activities relating to the account to March 31, 2014 is available on the Petroleum Branch website.

Opening Balance (April 1, 2013)	**1,238,169.38**
Deposits	
Levies and Penalties	380,699.30
Interest	13,898.58
Penalty of Inactive Well Levy	2,400.50
Recovery of Expenditures	8,243.10
Total Deposits	**404,894.18**
Expenditures and Refunds	**180,803.17**
Closing Balance (March 31, 2014)	**1,462,260.39**

Geology:

Geology provides geological support to government, public and industry on items requiring geological interpretations and considerations. This includes the assessment of areas for protected status, pipeline, unit and salt water disposal applications, the calculation of Holiday Oil Volume, updating the Manitoba Tops database, determining producing zones, managing and supervising the input of geophysical and geological information into our database and managing requests for core sampling and analysis.

Geology prepares reports on Manitoba's petroleum geology and hydrocarbon potential to encourage and assist in the exploration and development of the province's oil and gas resources. Geology maintains and updates a system for the designation of field and pool boundaries annually. As of January 1, 2014, Manitoba had 13 designated oil fields and 182 designated active oil pools.

Accomplishments in 20013/2014 include:

- Continued the restructuring of the geological sections procedures and data to enable digital access and submissions. Geology eliminated paper reporting allowing reduced environmental impact, costs and faster turnaround times.
- Assigned producing horizons to 656 wells.
- Interpreted 71 geophysical well logs
- Assigned Holiday Oil Volume to 415 wells.

Engineering and Inspection Section

Engineering:

Under the authority of the Drilling and Production Regulation and the Geophysical Regulation, Engineering processes drilling licenses, geophysical licenses and applications to re-complete, suspend, or abandon wells. It also issues permits for all oil and gas facilities. In 2013/14, a total of 684 drilling licences and 21 geophysical licences were issued. In addition, 66 technical well operations applications were processed.

The Petroleum Branch processed and approved 14 waterflood enhanced oil recovery projects in 2013/14. Tundra Oil & Gas created Sinclair Units No. 9-11, Ewart Units No. 2-5, Daly Units No. 6-7, North Pierson Unit No. 1 and Kola Unit No. 3. Fort Calgary created East Manson Unit No. 1, Surge Energy created East Manson Units No. 3-4, Legacy Oil + Gas created North Pierson Unit No. 2, and CNRL created South Pierson Unit No. 3.

The Petroleum Branch approved Ewart Unit No. 5 to pioneer an enhanced oil recovery in Manitoba that involves alternating nitrogen and salt water brine injection.

The Petroleum Branch also processed and approved 6 new pipeline applications totalling approximately 236.1 km of new pipeline infrastructure in Manitoba.

Information and advice are provided to the petroleum industry and the public at the Winnipeg, Virden and Waskada offices.

Inspection:

Inspection enforces regulations under The Oil and Gas Act related to geophysical, drilling, production, and pipeline operations. Specifically, the inspectors license and inspect field facilities, investigate complaints, witness specific operations, and interpret and communicate departmental or regulatory requirements to industry personnel. Inspectors are also responsible for carrying out safety and health inspections of petroleum industry operations under The Workplace Safety and Health Act. District offices are located in Virden and Waskada.

Through the 2013/14 year the Petroleum Inspection team inspected 134 oil and gas facilities. All batteries in the province were inspected at least once during the year. Inspection also inspected 30 service rigs and 9 different drilling rigs. A total of 150 non-compliance orders were issued in 2013/14 for wells and oil and gas facilities not in compliance with the Act. A total of 912 flow line applications were processed and 417 excavation permits issued.

Inspectors visited 158 abandoned well and battery sites to ensure that the approved abandonment procedures have been followed. During 2013/14, 156 Certificates of Abandonment were issued, allowing for the release of wells from performance deposit requirements. The unit also manages a program of environmental protection involving the rehabilitation of all oil or salt water spill sites. During 2013/14, 111 new spills were inspected and 9 spill sites were fully rehabilitated and released from the branch's rehabilitation program.

More information on spills is presented in the Petroleum Industry 2013 Spill Statistics and Report available from the branch or on the Petroleum Branch's website.

Digital Information Services Section

Digital Information Services is responsible for development and maintenance of computer systems within the branch. These systems include a diverse collection of activities such as web services, GIS, distribution of data to brokers, application development, document images and mapping services.

Digital Information Services has acted as the lead on conducting an opportunity assessment with Petrinex. Petrinex allows producers to digitally submit all information related to the tracking of volumetric oil and gas production data. Petrinex (formerly known as The Petroleum Registry of Alberta) has been used in Alberta since 2002. Saskatchewan has since joined Petrinex and went live with the program on April 1, 2012. The petroleum industry sponsored and partially funded the Opportunity Assessment for Manitoba as it is believed there would be operational benefits to have 3 provinces utilizing the same software system. Digital Information Services has met with Business Transformation and Technology (BTT) and Information Protection Centre (IPC) clearing the way for any data issues. Continued funding is required to continue to the next stage in the Registry process.

In 2013/14, the section continued to expand the offering of information available on the internet. The section provided ongoing support and development for GIS map products, Petroleum website enhancements and the Manitoba Oil and Gas Well Information System (MOGWIS).

Accomplishments in 2013/14 include:

- Working with BTT on the continuing development of the Petroleum Well Listing (PWL) which will enable industry to submit specific data to the branch (in the future PWL is expected to allow industry to view and submit logs)
- Development of digital document management structure.
- Continued research into data standardization with other jurisdictions through the investigation of the use of Petrinex;
- Continued support for the Petroleum Branch Manitoba Oil and Gas Well Information System
- Incorporated the WAG (Water Alternating Gas) Incentive into the Tax and Royalty Audit Program
- Frac Focus – investigated the use of FracFocus for disclosure of hydraulic fracturing fluids and is completing contractural arrangements for use of this software.
- Continued updating of Petroleum datasets for outside use
- New Map gallery initiated on website
- Started upgrade process to newer database by recompiling existing forms to newer version

Minister's and Director's Approvals

Under The Oil and Gas Act, the Minister and the Director of Petroleum have authority to issue orders relating to drilling, production, storage and transportation of oil and gas. The Minister has authority to make orders relating to well spacing, enhanced recovery, maximum production rates, seizure of wells and facilities and to enter into Unit Agreements on behalf of the Crown. The Lieutenant Governor in Council has delegated parts of this authority, under Order in Council 384/2001, to the Director where the circumstances are considered routine. The Director has authority to issue orders relating to salt water disposal, designation of field and pools, designation of new oil status and to affect the seizure of wells and facilities of a non-compliant operator pursuant to a Ministerial Seizure Order.

In 2013/14 the Minister made the following orders:

Missing Royalty Owner N 1/2 Section 19-1-28 W1	Apr. 11, 2013	Legacy Oil + Gas Inc.
Missing Royalty Owner SW ¼ 26-18-29 W	Aug. 27, 2013	Tundra Oil & Gas Partnersl
Missing Royalty Owner S 1/2 1-9-29 W1	Oct. 2, 2013	Tundra Oil & Gas Partnersl
Missing Royalty Owner NE ¼ 34-1-27 W1	Oct. 30, 2013	Legacy Oil + Gas Inc.
Missing Royalty Owner N 1/2 32-10-28 W1	Nov. 4, 2013	Tundra Oil & Gas Partnersl

Missing Royalty Owner SW ¼ 31-8-28 W1	Nov. 26, 2013	Tundra Oil & Gas Partnersl
Missing Royalty Owner NW ¼ 31-8-28 W1	Nov. 29, 2013	Tundra Oil & Gas Partnersl
Missing Royalty Owner NE ¼ 8-9-28 W1	Feb. 3, 2014	Tundra Oil & Gas Partnersl
Missing Royalty Owner NW ¼ 20-1-28 W1	Mar. 18, 2014	Legacy Oil + Gas Inc.
Pipeline Construction Permit No. 2013-04	May 7, 2013	EOG Resources
Pipeline Construction Permit No. 2013-06	Aug. 7, 2013	Penn West Petroleum Ltd.
Pipeline Operating Permit No. 2013-07	Oct 30, 2013	Legacy Oil & Gas
Pipeline Operating Permit No. 2013-08	Dec 20, 2013	Penn West Petroleums Ltd
Pipeline Construction Permit No. 2014-01	Mar 10, 2014	Tundra Energy Marketing L
Unit Agreement (East Manson Unit No. 1)	May 1, 2013	Fort Calgary Resources Lt
Unit Agreement (Sinclair Unit Unit No.10)	Aug 1, 2013	Tundra Oil & Gas Partnersl
Unit Agreement (Ewart Unit No. 2)	Aug 1, 2013	Tundra Oil & Gas Partnersl
Unit Agreement (Ewart Unit No. 3	Aug 1, 2013	Tundra Oil & Gas Partnersl
Unit Agreement (Ewart Unit No. 4)	Aug 1, 2013	Tundra Oil & Gas Partnersl
Unit Agreement (North Pierson Unit No. 1)	Jan 1, 2014	Tundra Oil & Gas Partnersl
Unit Agreement (Sinclair Unit No. 11)	Mar 1, 2014	Tundra Oil & Gas Partnersl
Unit Agreement (Daly Unit No. 6)	Jan 1, 2014	Tundra Oil & Gas Partnersl
Unit Agreement (Daly Unit No. 7)	Jan 1, 2014	Tundra Oil & Gas Partnersl
Unit Agreement (East Manson Unit No. 3)	Mar 1, 2014	Surge Energy Inc.
Unit Agreement (North Pierson Unit No, 2)	April 1, 2014	Legacy Oil + Gas

In 2013/14, the Director of Petroleum made the following orders:

Water Flood Order 24	July 1, 2013	Red River Oil
Water Flood Order 25	Jul 1, 2013	Tundra Oil & Gas Partnership
Water Flood Order 26	Jul 1, 2013	Tundra Oil & Gas Partnership
Water Flood Order 27	Aug 1, 2013	Tundra Oil & Gas Partnership
Water Flood Order 28	Aug 1, 2013	Fort Calgary Resources Ltd.
Water Flood Order 29	Aug 1, 2013	Tundra Oil & Gas Partnership.
Water Flood Order 30	Aug 1, 2013	Tundra Oil & Gas Partnership
Water Flood Order 31	Jan 1, 2014	Tundra Oil & Gas Partnership
Water Flood Order 32	Mar 1, 2014	Surge Energy Inc.
Salt Water Disposal No. 247	May 1, 2013	Tundra Oil & Gas Partnership
Salt Water Disposal No. 248	Jun 6, 2013	Elcano Exploration Inc.
Salt Water Disposal No. 249	Jul 5, 2013	Newalta Corporation
Salt Water Disposal No. 250	Jan 29, 2014	EOG Resources Canada Inc.
Salt Water Disposal No. 251	Jan 29, 2014	EOG Resources Canada Inc.
Salt Water Disposal No. 252	Feb 27, 2014	Corex Resources Ltd.
Salt Water Disposal No. 253	Mar 7, 2014	Tundra Oil & Gas Partnership

Petroleum Industry Overview:

	2013	2012
New wells drilled	537	616
Oil Production	3,053,837 m^3 (19.2 million bbls)	3,005,826.9 m^3 (18.9 million bbls)
Value of oil sales ($million)	$1,760	$1,599
Average selling price	$577.45 m^3($91.76/bbl)	$531.95 m^3($84.53bbl)
Wells producing - December	4,824	3,741
Estimated Industry Expenditures ($million)	$1,300	$1,482

More comprehensive information and historical statistics on Manitoba's petroleum industry are presented in the Oil Activity Review available from the Petroleum Branch.

18-2(c) Petroleum

Expenditures by Sub-Appropriation	Actual 2013/14 $(000)	Estimate 2013/14 FTE	Estimate 2013/14 $(000)	Variance Over (Under)	Expl. No.
Total Salaries & Employee Benefits	1,627	22.50	1,591	36	
Total Other Expenditures	436		378	58	
Total Sub-Appropriation	**2,063**	**22.50**	**1,969**	**94**	

BOARDS AND COMMISSIONS

OBJECTIVES

To provide for the resolution of disputes between surface rights holders, mineral rights, and oil and gas rights holders with respect to accessing minerals, oil and gas.

Mining Board

The Mining Board is established under the Mines and Minerals Act. The primary function of the Board is the arbitration of disputes between surface rights holders and mineral rights holders with respect to accessing of minerals other than oil and gas. The Board can also hear and resolve disputes between holders of mineral dispositions and between holders and officers of the Department.

In 2013 the Mining Board received one request for immediate access and also addressed the issue of compensation.

Surface Rights Board

The Surface Rights Act establishes a quasi-judicial process for resolving land access and development disputes between oil and gas development proponents and surface rights holders. The Act also establishes a Board to arbitrate and mediate disputes and establishes appropriate compensation for petroleum development activities. Land Management provides administrative support to the process and the Board.

Due to its quasi-judicial nature, the Board operates independently and is attached to the Department for administrative reasons only.

Highlights for 2013 include reviewing 59 parcels of land for right of way and compensation for pipeline applications, and 38 parcels of land for review of back payment on rental adjustments. Other significant activities for the fiscal year include improving the administrative process and procedures for the Board activities, including public consultation and written comments from stakeholders.

	2010	2011	2012	2013
Signed Agreements for Surface Leases (fiscal year)	415	470	344	317
Total Number of Recorded Surface Leases	4,562	5,032	5,376	5,693
Review of Right of Way Applications	28	3	3	59
Review of Compensation Applications	0	3	5	6
Termination of Board Orders	0	0	0	0
Application for Abandonment Orders	0	0	0	0
Board Orders Issued	0	3	4	42
Mediation Reports	0	0	0	0

18-2(d) Boards and Commissions

Expenditures by Sub-Appropriation	Actual 2013/14 $(000)	Estimate 2013/14 FTE	Estimate 2013/14 $(000)	Variance Over (Under)	Expl. No.
Total Salaries and Employee Benefits	25		30	(5)	
Total Other Expenditures	26		16	10	
Total Sub-Appropriation	**51**		**46**	**5**	

MINERAL INDUSTRY SUPPORT PROGRAMS

The Mineral Industry Support Programs are delivered under Manitoba Geological Survey.

Mineral Exploration Assistance Program

The Mineral Exploration Assistance Program (MEAP) provides financial assistance to eligible companies or individuals who undertake mineral exploration in Manitoba. Established in the fall of 1995, MEAP was renewed for an additional three years starting with the April 2011 offering and will expire in 2013/2014. The program provides a single offering each year with $1.5 million of assistance annually. The program was designed to increase exploration and stimulate activities that may lead to the development of new mines. Companies/individuals may qualify for 25% - 35% of eligible exploration expenditures up to a maximum of $200,000.00 per recipient, per fiscal year; depending on the area of exploration. A higher percentage of assistance is offered for projects undertaken in the Northern Superior region of the province, due to remoteness and limited infrastructure. MEAP has extended the higher percentage of assistance on eligible expenditures to include the Lynn Lake/Leaf Rapids areas.

Companies with approved projects under the April 2013 offering had until March 31, 2014 to complete their work. Thirteen of the original 22 approved projects were completed.

Mineral Resources successfully secured renewed funding for the MEAP program for fiscal year 2014/2015 at an increased level of support of $3.0 million. The additional funding will allow MEAP to provide 40% of eligible exploration expenditures up to a maximum of $200,000.00 per recipient for non-remote regions of the province and 50% of eligible exploration expenditures up to a maximum of $200,000.00 per recipient in Northern Superior and the Lynn Lake/Leaf Rapids region of the province.

Reviews, Audits and Inspections

To ensure accountability and integrity of the Program, the Department continued to conduct audits and site inspections following guidelines developed with the Provincial Internal Audit office. In the 2012/2013 fiscal year, Mineral Resources and the Provincial Internal Audit Office decided to forego internal audits of the program due to other priorities within Internal Audit and past history of administration of the program. Site inspections are conducted on a random or as needed basis.

Program Highlights from October 1995 to March 31, 2014

- 189 companies have participated under MEAP of which:
  - 148 companies are considered new to Manitoba.
  - 16 are major exploration companies, and
  - 173 are junior companies (note: a company is considered a major exploration company if its market capitalization is greater than $100 million).
- $30.3 million of assistance has been issued to 782 completed projects.
- $267.9 million in exploration expenses have been reported.
- Reported exploration expenditures under the Program indicate every $1 million in assistance paid generates $8.8 million in exploration expenditures.
- For every dollar of MEAP assistance, the Manitoba Bureau of Statistics estimates that there is $1.85 in taxes collected in Manitoba.

Mineral Exploration Assistance Program 2013 Status

Offering	Applications Received	Approved Applications	Proposed Exploration $ in 000's	Assistance $ Allocated in 000's	Projects Completed	Actual Exploration $ in 000's	Assistance $ Paid
13-04-02	22	22	24,553.5	1,500.0	13	12,002.2	728.9
TOTAL	**22**	**22**	**24,553.5**	**1,500.0**	**13**	**12,002.2**	**728.9**

Note: Projects approved under the April, 2013 offering have until June 14, 2014 to file final reports and make application for final payment

Results of Assistance by General Region of Exploration for 2013/2014

	Projects		Exploration $ in 000's		Assistance $ in 000's	
Far North	0	(0.0%)	$ 0	(0.0%)	$0	(0.0%)
Flin Flon/Snow Lake	5	(22.7%)	$729.1	(6.1%)	$100.2	(13.7%)
Hudson Bay Lowland	0	(0.0%)	$0.0	(0.0%)	$0.0	(0.0%)
Lynn Lake/Leaf Rapids	0	(0.0%)	$0.0	(0.0%)	$0.0	(0.0%)
Northern Superior	3	(13.6%)	$594.7	(5.0%)	$97.2	(13.3%)
SE Trans-Hudson Orogen	0	(0.0%)	$ 0.0	(0.0%)	$0.0	(0.0%)
Southeastern Manitoba	7	(31.8%)	$1,385.9	(11.5%)	$270.8	(37.2%)
South Central Manitoba	2	(9.1%)	$0.0	(0.0%)	$0.0	(0.0%)
Thompson Nickel Belt - Superior Boundary Zone	5	(22.7%)	$9,292.5	(77.4%)	$260.7	(35.8%)

Manitoba Prospectors Assistance Program

The Manitoba Prospectors Assistance Program (MPAP) offers grants to prospectors conducting exploration on either their own Manitoba properties or open Crown land. The Program is targeted at increasing mineral exploration in Manitoba to help replenish declining ore reserves. The Program is funded at $23,000 per year and allows individual prospectors to qualify for up to 50% of their prospecting expenditures incurred up to a maximum of $7,500 per prospector per year. The program also provides 80% of the cost of one return charter flight or $1,500.00 per year, whichever is less, for projects undertaken in more remote areas of the Province. The maximum assistance of $9,000.00 is available per applicant, per year.

In 2013/14 the program received 4 applications for grants; 4 prospecting projects were approved under the program and 4 were completed. The total amount of Program funds dispersed for 2013/2014 was $12,310.23.

Bill Hood	940.23
Ken Klyne	3,870.00
Harold Westdal (2 projects)	7,500.00
Total Funds Dispersed:	$12,310.23

Mineral Resources successfully secured renewed funding for the MPAP program for fiscal year 2014/2015 at an increased level of support of $125,000. This represents a five-fold increase in the available assistance to prospectors, which will allow Mineral Resources to increase the maximum assistance to $10,000 per prospector per year.

Manitoba Potash Project

Manitoba Mineral Resources has consolidated the potash resource amendable to conventional mining on the Russell McAuley deposit in an effort to facilitate the future development of a conventional potash mine. The resource consolidation was achieved through the acquisition of the 51% share of the Manitoba Potash Corp owned by joint venture partner BHP-Billiton, which controls the northern block in the Russell area, and the withdrawal of the Crown potash rights in the contiguous southern block in the St. Lazare area following the termination of a potash exploration permit held by Agrium Corp. The consolidation of the resource in the Russell McAuley deposit represents a critical step towards attracting credible developers.

Manitoba Potash Corporation contracted Micon International to develop and execute a marketing strategy designed to identify and engage potential potash developers. Micon also provided analysis of the potash market in advance of the launch of the marketing strategy and has prepared the necessary technical information required to successfully market the Russell-McAuley deposit which contains an estimated 1.0 billion tonnes grading 20.9% K2O. The marketing strategy developed by Micon will solicit Expressions of Interest from a prioritized list of international potash and fertilizer industry companies with the intent of selecting a developer with the experience and resources to develop a conventional potash mine and provide the region with economic and social development opportunities.

18-2(e) Mineral Industry Support Programs

Expenditures by Sub-Appropriation	Actual 2013/14 $(000)	Estimate 2013/14 FTE	Estimate 2013/14 $(000)	Variance Over (Under)	Expl. No.
Mineral Industry Support Programs					
- Manitoba Potash Project	86	0.00	97	(11)	
Total Sub-Appropriation	**91**	**0.00**	**97**	**(11)**	

Mineral Exploration Assistance Program and Manitoba Prospectors Assistance Program are paid directly from Mining Community Reserve Fund (MCR).

COSTS RELATED TO CAPITAL ASSETS

Commencing in 1999/2000, it is the policy of the Province of Manitoba to record in the accounts of the Province, the tangible capital assets owned and used by the Province along with appropriate amortization costs. The Provincial Comptroller has established standard asset classes, along with capitalization thresholds and corresponding amortization rates.

18-6 Amortization and Other Costs Related to Capital Assets

Expenditures by Sub-Appropriation	Actual 2013/14 $(000)	Estimate 2013/14 FTE	Estimate 2013/14 $(000)	Variance Over (Under)	Expl. No.
(a) Amortization Expense	380		380	-	
(b) Interest Expense	259		260	(1)	
Total Expenditures	**639**		**640**	**(1)**	

MINERAL RESOURCES

Reconciliation Statement

EXPENDITURE DETAILS	
2013/14 MAIN ESTIMATES	10,780
MAIN ESTIMATES AUTHORITY TRANSFERRED FROM:	
• **Enabling Appropriations**	
- Internal Services Adjustment	627
2013/14 ESTIMATE	11,407

Mineral Resources
Expenditure Summary
For Fiscal Year Ended March 31, 2014 (with comparative figures for the previous year)

Estimate 2013/14 $(000)			Appropriation	Actual 2013/14 $(000)	Actual 2012/13 $(000)	Increase (Decrease) $(000)	Explanation Number
	18-1		**Administration and Finance**				
37		(a)	Minister's Salary	37	33	-	
		(b)	Executive Support				
492			(1) Salaries and Employee Benefits	445	426	19	
73			(2) Other Expenditures	68	69	(1)	
150		(c)	Administration and Finance	150	150	-	
752			Total 18-1	700	682	18	
	18-2		**Mineral Resources**				
		(a)	Manitoba Geological Survey				
3,946			(1) Salaries and Employee Benefits	3,807	3,957	(150)	
2,005			(2) Other Expenditures	2,137	2,061	76	
		(b)	Mines				
1,341			(1) Salaries and Employee Benefits	1,266	1,246	20	
658			(2) Other Expenditures	4,307	1,476	2,831	*1*
		(c)	Petroleum				
1,591			(1) Salaries and Employee Benefits	1,627	1,531	96	
378			(2) Other Expenditures	436	452	(16)	
		(d)	Boards and Commissions				
30			(1) Salaries and Employee Benefits	25	16	9	
16			(2) Other Expenditures	26	11	15	
		(e)	Mineral Industry Support Programs				
			(1) Mineral Exploration Assistance Program				
			(2) Prospectors' Assistance Program				
97			(3) Manitoba Potash Project	86			
11,407			Total 18-2	13,717	10,841	2,876	

Expenditure Summary

Estimate 2013/14 $(000)		Appropriation	Actual 2013/14 $(000)	Actual 2012/13 $(000)	Increase (Decrease) $(000)	Explanation Number
	18-3	**Costs Related to Capital Assets**				
380	(a)	Amortization Expense	380	380	-	
260	(b)	Interest Expense	259	279	(20)	
640		Total 18-3	639	659	(20)	
11,407		**TOTAL MINERAL RESOURCES**	15,056	12,182	2,874	

1. *Environmental Liabilities*

Mineral Resources
Revenue Summary by Source
For Fiscal Year Ended March 31, 2014 with comparative figures for the previous fiscal year ($000's)

Actual 2012/13	Actual 2013/14	Increase (Decrease)	Source	Actual 2013/14	Estimate 2013/14	Variance	Expl. No.
			Taxation				
7,823	5,592	(2,231)	Oil and Natural Gas Tax	5,592	11,301	(5,709)	*1*
10,018	5,592	(2,231)	Sub-Total	5,592	11,433	(5,709)	
			Other Revenue				
14,630	13,094	(1,536)	Petroleum Royalties and Fees	13,094	24,624	(11,530)	*2*
4,720	4,630	(90)	Minerals Royalties and Fees	4,630	4,450	180	
1	1	0	Sundry	1	3	(2)	
19,351	17,725	(1,626)	Sub-Total	17,725	29,077	(11,352)	
27,174	**23,317**	**(3,857)**	**Total**	**23,317**	**40,378**	**(17,061)**	

Explanations:

Comparison to Previous Year

1. *Lower tax rate*
2. *Decreased land sales*

Comparison Actual to Estimate

1. *Lower tax rate*
2. *Less land sales and lower tax rate than estimated*

FIVE YEAR HISTORY

Mineral Resources

Five-Year Expenditure and Staffing Summary by Main Appropriation ($000s)

For Five Years Ended March 31, 2014*

	Actual/*Adjusted Expenditures									
	2009-2010		2010-2011		2011-2012		2012-2013		2013-2014	
	FTE	$	FTE	$	FTE	$	FTE	$	FTE	$
Administration and Finance	6.00	680	6.00	664	6.00	669	6.00	682	6.00	700
Mineral Resources	101.60	11,175	101.60	10,556	103.60	34,483	106.10	10,841	102.10	13,717
Amortization and Other Costs Related to Capital Assets		-		-		337		659		640
TOTAL OPERATING	107.60	11,855	107.60	11;220	109.60	35,489	112.10	12,182	108.10	15,057
Expenditures Related to Capital Investment		2.083		1.899		848		-		-
TOTAL	107.60	13,938	107.60	13,119	109.60	36,337	112.10	12,182	108.10	15,057

* - Adjusted figures reflect historical data on a comparable basis in those appropriations affected by reorganizations during the five years

MINERAL RESOURCES
2013/14 Annual Report Performance Measurements

The following section provides information on key performance measures for the department for the 2013-14 reporting year.

Performance indicators in departmental Annual Reports are intended to complement financial results and provide Manitobans with meaningful and useful information about government activities, and their impact on the province and its citizens.

For more information on performance reporting and the Manitoba government, visit www.manitoba.ca/performance.

Your comments on performance measures are valuable to us. You can send comments or questions to mbperformance@gov.mb.ca.

Mineral Resources Performance Measures Document for inclusion in the 2013/14 Annual Report

Priority: Encourage, promote and facilitate investment in the sustainable development of Manitoba's mineral and petroleum resources.

What is being measured? (A)	How is it being measured (name of indicator)? (B)	Why is it important to measure this? (C)	What is the starting point? (baseline data and year) (D)	What is the most recent available data? (E)	What is the trend over time? (F)
Annual mineral exploration expenditures	Annual mineral exploration expenditures are the most direct indicator[1] of the level of mineral exploration in the Province.	One of the primary roles of the department is to promote investment in Manitoba mineral and petroleum resources.	2002 Mineral exploration : $29.8 million	Mineral exploration and deposit appraisal ($ million) and percentage of Canadian expenditures 2013: $ 57.7 (2.5%)	Manitoba's mineral exploration expenditures fluctuate with commodity prices and global economic conditions. Manitoba's share of Canadian exploration expenditures has declined since 2011.
Annual petroleum industry exploration and development capital expenditures	Annual petroleum industry expenditures are the most direct indicator[2] of the level of investment in Manitoba's petroleum resources.	One of the primary roles of the department is to promote investment in Manitoba mineral and petroleum resources.	2002 Petroleum exploration and development capital expenditures: $65.6 million	Petroleum exploration and development capital expenditures: 2012: $918.0 million 2012: $930.7 million (revised) 2013: N/A	Petroleum exploration and development capital expenditures in Manitoba have increased dramatically with continuing high oil prices and the successful application of new horizontal well completion technology in Manitoba's tight oil reservoirs.

Priority: Expand Manitoba's geological knowledge base.

The number of reports, maps and other geoscience publications produced each year.	The department tracks the number of publications produced each year.	One of the primary roles of the department is to provide authoritative geoscience information to support and facilitate mineral and petroleum exploration.	2005/06 publications - 6 geoscience reports - 47 maps - 3 new digital products	2012/13 publications - 2 open file reports - 3 geoscientific reports - 7 preliminary maps - 6 data repository items - 10 virtual Geotours (YouTube™)	The number and type of publications produced by the department has evolved to meet client needs. The ability to produce publications is a function of staffing levels.

[1] Mineral exploration expenditure statistics are public (compiled by Natural Resources Canada) unbiased, accurate, and available going back many years. They can be translated into jobs and tax revenue using information supplied by the Manitoba Bureau of Statistics. These numbers are a roll-up type indicator that reflects not only the impacts of government policy and programs, but also external factors. They are strongly influenced by commodity prices, projected worldwide supply and demand, and even weather conditions. Accordingly, such indicators cannot be viewed in isolation of worldwide trends or local developments. They are not influenced solely by government policy.

[2] petroleum industry exploration and development capital expenditures are public (compiled Canadian Association of Petroleum Producers), unbiased, accurate, and available going back many years. They can be translated into jobs and tax revenue using information supplied by the Manitoba Bureau of Statistics. These numbers are a roll-up type indicator that reflects not only the impacts of government policy and programs, but also external factors. They are strongly influenced by commodity prices, projected worldwide supply and demand, and even weather. Accordingly, such indicators cannot be viewed in isolation of worldwide trends or local developments. They are not influenced solely by government policy.

What is being measured? (A)	How is it being measured (name of indicator)? (B)	Why is it important to measure this? (C)	What is the starting point? (baseline data and year) (D)	What is the most recent available data? (E)	What is the trend over time? (F)

Priority: Protect the environment and ensure rehabilitation of lands impacted by resource development.

Annual pit and quarry rehabilitation expenditures.	Number of projects completed by the department; amount of land rehabilitated; and annual expenditures.	A key determinant of the effectiveness of the department's Pits and Quarry Rehabilitation Program.	1993: No. of Projects – 75 Area – 360 hectares Expenditures - $490,777	2013: No. of Projects – 91 Area – 327 hectares Expenditures - $3,341,629	The cost per hectare of land rehabilitated has increased from $1393/ha in 1993 to $10,149/ha in 2013.

Footnote:

The Department of Mineral Resources, formerly a division of Innovation, Energy and Mines, was established in recognition of the importance of strong mining and petroleum sectors to the growth of Manitoba's economy and the creation of jobs.

Mineral Resources 2014/15 Department Plan was developed in reference to the former IEM plan. Under the 2013/14 IEM Department Plan, the Mineral Resources Division had a single priority and eight (8) objectives. In the 2014/15 Department Plan many of the former department objectives have been elevated to priorities in recognition of their importance in achieving the department's vision and mission.

The Public Interest Disclosure (Whistleblower Protection) Act

The Public Interest Disclosure (Whistleblower Protection) Act came into effect in April 2007. This law gives employees a clear process for disclosing concerns about significant and serious matters (wrongdoing) in the Manitoba public service, and strengthens protection from reprisal. The Act builds on protections already in place under other statutes, as well as collective bargaining rights, policies, practices and processes in the Manitoba public service.

Wrongdoing under the Act may be: contravention of federal or provincial legislation; an act or omission that endangers public safety, public health or the environment; gross mismanagement; or, knowingly directing or counselling a person to commit a wrongdoing. The Act is not intended to deal with routine operational or administrative matters.

A disclosure made by an employee in good faith, in accordance with the Act, and with a reasonable belief that wrongdoing has been or is about to be committed is considered to be a disclosure under the Act, whether or not the subject matter constitutes wrongdoing. All disclosures receive careful and thorough review to determine if action is required under the Act, and must be reported in a department's annual report in accordance with Section 18 of the Act.

Information Required Annually (per Section 18 of The Act)	**Fiscal Year 2013 – 2014**
The number of disclosures received, and the number acted on and not acted on. *Subsection 18(2)(a)*	**NIL**
The number of investigations commenced as a result of a disclosure. *Subsection 18(2)(b)*	**NIL**
In the case of an investigation that results in a finding of wrongdoing, a description of the wrongdoing and any recommendations or corrective actions taken in relation to the wrongdoing, or the reasons why no corrective action was taken. *Subsection 18(2)(c)*	**NIL**

APPENDIX A

ASSOCIATED AGENCIES, BOARDS, COMMISSIONS and COUNCILS

MANITOBA GAMING CONTROL COMMISSION

The Manitoba Gaming Control Commission is the primary regulatory body responsible to ensure that gaming activities are conducted with honesty, integrity and in the public interest. The Manitoba Gaming Control Commission tables its annual report under separate cover with the Manitoba Legislature.

MINING BOARD

The board arbitrates disputes with respect to accessing of minerals other than oil and gas. The board can hear and resolve dispute between holders of mineral dispositions and between holders and officers of the Departments. The board can also advise on matters relating to the pooling of mineral operations and to the designation of land as limited use land.

SURFACE RIGHTS BOARD

The Surface Rights Act establishes a Quasi-judicial board to administer and enforce the Surface Rights Act. Responsible for resolving land access and development disputes between oil and gas development proponents and surface rights holders. The Board also arbitrates and mediates disputes and establishes appropriate compensation for petroleum activities.